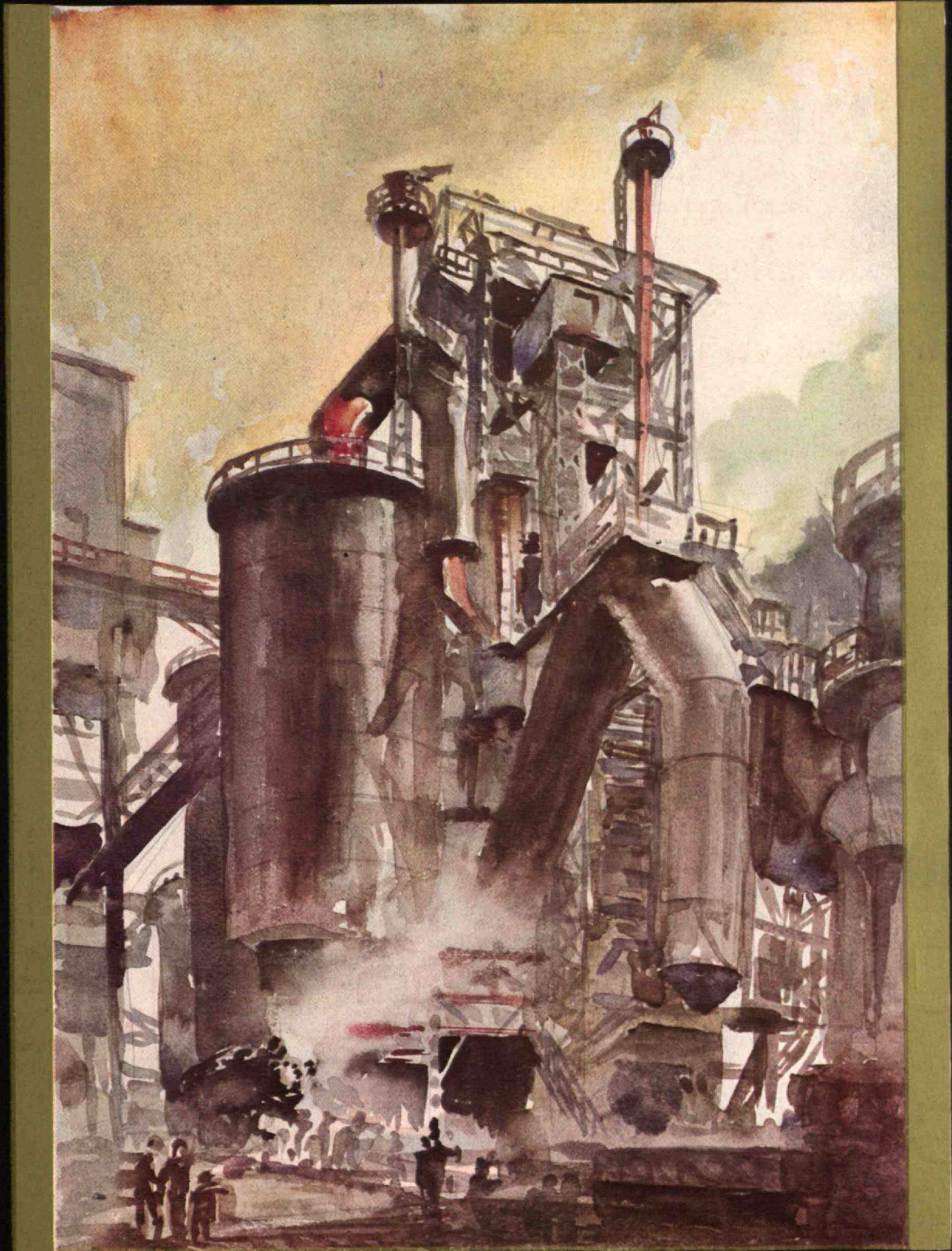


# THE TECHNOLOGY REVIEW

MARCH 1931



# technology review

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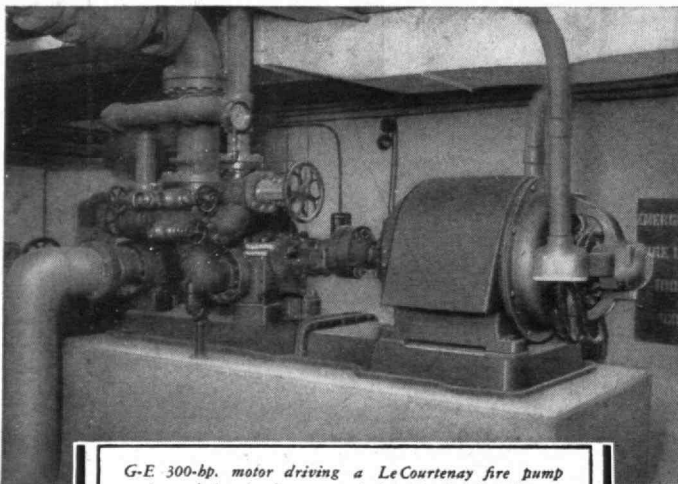


# DRIVING A RIVER UP A SKYSCRAPER

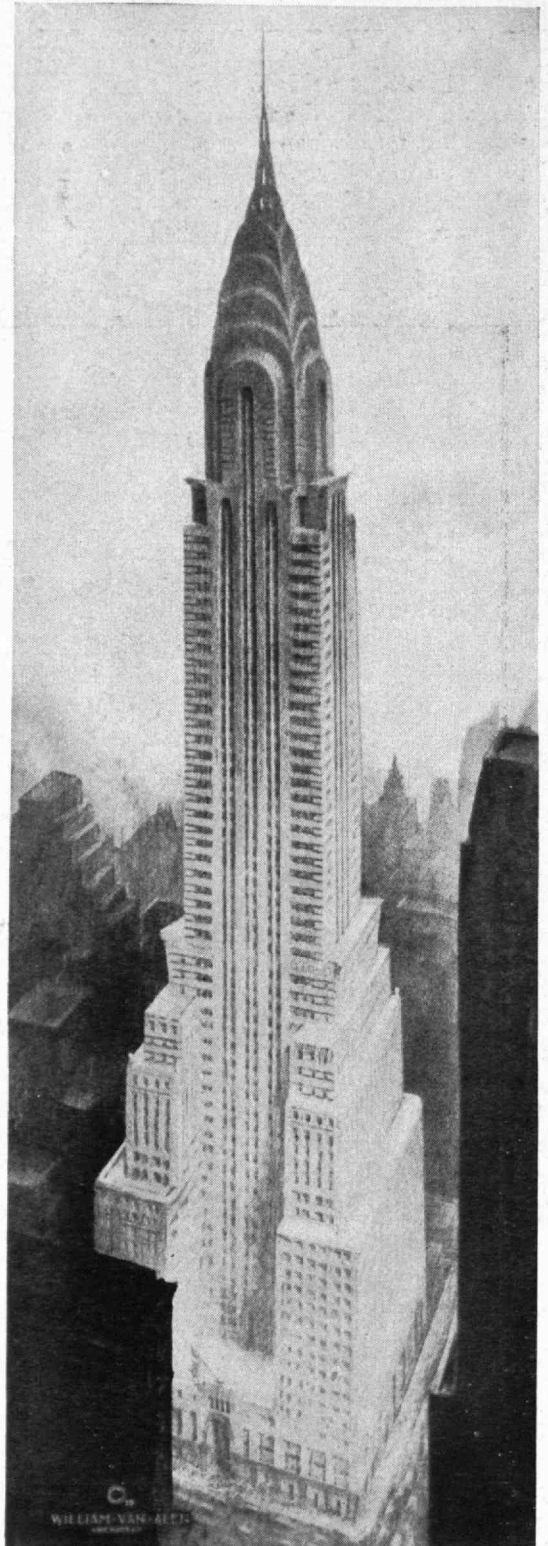
**S**EVEN hundred and fifty gallons of water a minute pouring out from three nozzles over one thousand feet above the busy streets of Manhattan—a small river driven skyward 77 stories—that's the service afforded by the G-E motorized fire pumps of the famous Chrysler building.

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*G-E 300-hp. motor driving a LeCourtenay fire pump located in the basement of the Chrysler building, New York City*

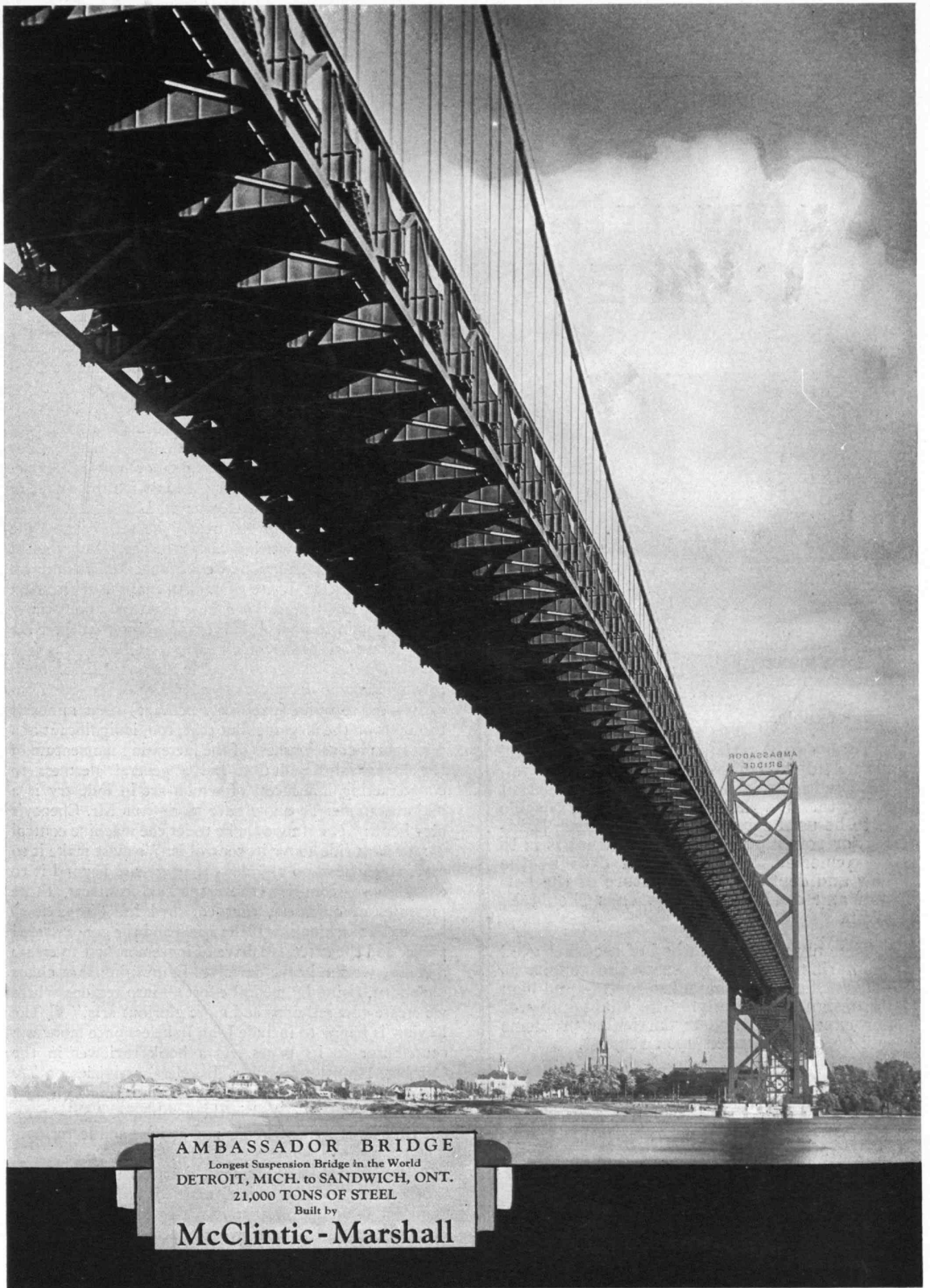


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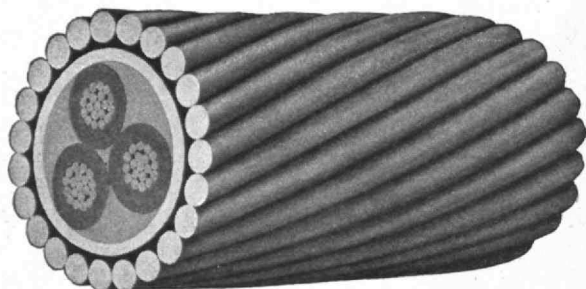
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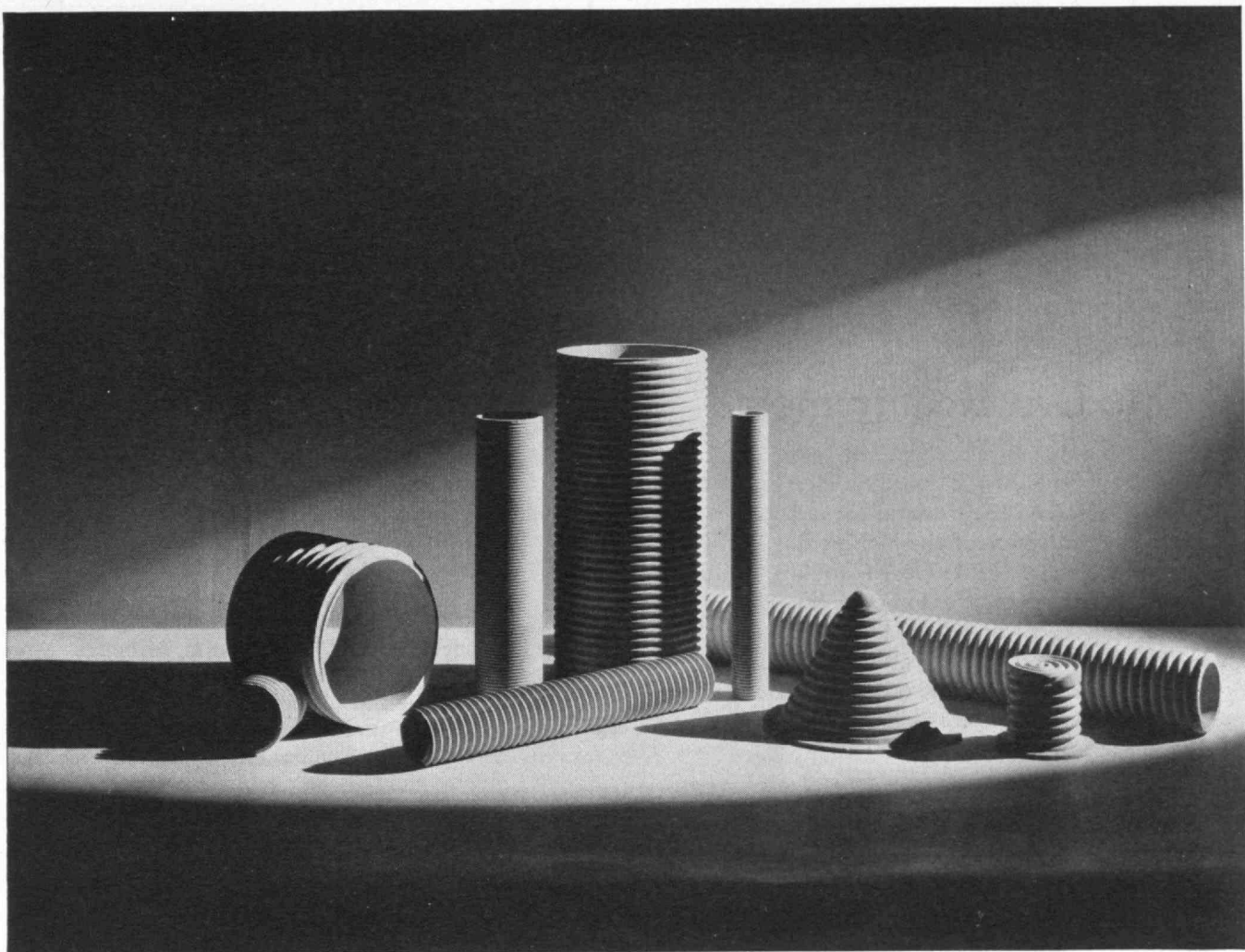
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## THE TABULAR VIEW

"WE ARE past," says Sheldon Cheney in his provocative book, *The New World Architecture*, "the possibility of challenging the machine, of curbing it, of attempting to escape from it. . . . We must move by machinery, communicate by it — live by it." In his article, "Machine-Made Minds," Mr. BAKELESS develops a correlative thesis: we cannot escape having our thinking conditioned by the machine. In so doing, he has brought out, as did the recent play "Berkeley Square," the impossibility of modern man to be happy in any other environment. The romance of the past could not substitute adequately for the relinquished comforts of the Twentieth Century. ¶ Mr. Bakeless, we feel, has attained an admirable state of Teufelsdröckhian detachment from the usual prejudiced criticism. His interest is not inspired by prospects of personal gain or loss, but comes rather from a very real preoccupation with the course of human progress and development. Like the German philosopher of "Sartor Resartus," he sees beyond the superficial aspects, writing rather of the psychological consequences of man in a new environment. The problem is thus interpreted as one of adjustment: the application of natural intelligence to a new situation, potentially neither good nor bad. ¶ It is encouraging that there are such astute critics of contemporary civilization as Mr. Cheney, Mr. Bakeless, and Mr. Stuart Chase. Such attacks seem to have awakened many otherwise critically inert to write (overfreely perhaps) their minutest thoughts on the machine. But that, too, is significant of a widespread consciousness of the increasing momentum of the Industrial Revolution and a general alertness to counteracting influences, of which art in industry is a major example. To quote once more from Mr. Cheney's new book: "The sin would be to let the machine control us: we must ride above it, control it. We must make it so easy, so efficient, so noiseless, that we rise beyond it to enjoy those serenities, those spiritual contacts, those pleasures of quietness, that enriched life (for a few) before the machine era. If the speed and the concentrated power and the extensive drive of it seem at first to create a chaos, we shall save ourselves by pushing that chaos underfoot, rising by mental effort — into regions where we create new religions and more glorious arts." ¶ The Review is happy to include John Bakeless once more as a contributor to its pages. As a book reviewer in the October, 1930, Review, Mr. Bakeless' activities on *The Living Age*, *The Independent*, and as Managing Editor of *The Forum* were described in these columns. At the present time he is writing books and articles and lecturing.

THE DEUTSCHES Museum, described by HARRY J. CARLSON in his article entitled "Fifty Pfennigs' Worth," is unique in that it possesses continuity and dramatic interest. These two characteristics go a long way to make it one of the most popular museums in Europe. Not many museums can boast of visitors that annually outnumber the population of the towns in

(Continued on page 268)



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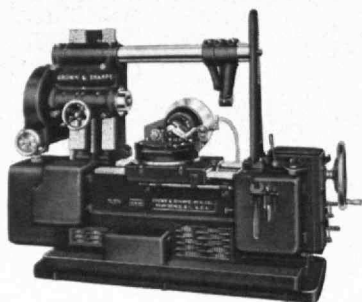
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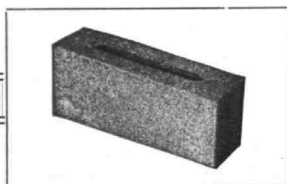


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## THE TABULAR VIEW

(Continued from page 266)

which they are located. Even its manner of erection was unusual for modern times. Laborers gave their services on Sundays and holidays, and all Germany seemed to have a part in the assembling and the building. This general contribution of talents is reminiscent of the medieval spirit of community coöperation in the building of the great cathedrals. The results in both cases were more than could ever be obtained through organized labor. ¶ All this became possible under the direction of the remarkable Dr. Oscar von Miller who thus created the most outstandingly successful experiment in visual education yet made. Within this one building are the contributions of centuries of scientific development, forming nine miles of exhibits — 60,000 things to see — and each occupies its proper place in the evolution of the major branches of science, engineering, and industry. ¶ Although Mr. Carlson was born in St. Paul, Minnesota, he has lived in Boston most of his life. After his graduation from the Institute in 1892 he studied at the Atelier Duray, Paris, for two years. Since 1903 he has been connected with the firm of Coolidge and Carlson, architects. While continuing his practice of architecture, he lectured at the Massachusetts Normal Art School on the History of Architecture and Building Construction. As an alumnus, he has been unusually active in affairs of the Institute. He became a life member of the Corporation in March, 1921, and was President of the Alumni Association the following year. As an architect, his services were of value to President Maclaurin as one of the three architectural advisors in regard to the location of the new Technology buildings. He is also known as the architect of the new Guggenheim Aeronautical Laboratory at the Institute. Some of his best known structures are: "Dreamworld," the estate of Thomas Lawson; the Normal and Latin Group, Boston; Harvard, Wellesley and Technology dormitories; and the library of Hamilton College. In 1928 Bates College awarded an honorary master's degree to Mr. Carlson, "whose mastery of one of the finest of arts has given to this campus three notable buildings. He is a preacher in stone of the gospel that utility is most useful when joined to beauty."

**D**ONALD C. STOCKBARGER, author of one of The Review's most celebrated articles, "Check the Sun Bath," appears again in this issue. His article, "The Useful Spectroscope," surveys the contributions that spectroscopy has made to the sciences. "The spectroscope," reads the article, "has become one of the greatest of the tools of science, yielding secrets about chemical compounds otherwise undiscoverable, reaching out to the stars, breaking into the atom, showing the kinship of the infinitely large with the unbelievably small." ¶ Dr. Stockbarger has labored long in the field of radiation. The radiation laboratory at the Institute, which is under his supervision, was among the first of its kind to be established in this country. Work has been carried on

(Continued on page 270)

# 442 Johnson Room Thermostats Control 867 Radiator Valves In Shell Oil Building, San Francisco

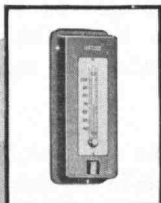
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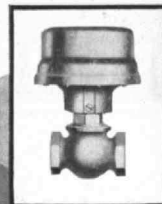
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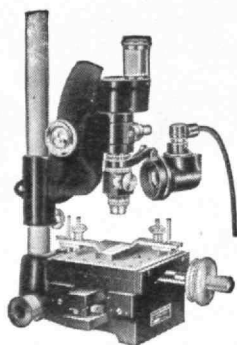


J. G. Russell, '13

H. Russell, '16

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## THE TABULAR VIEW

(Concluded from page 268)

there in great variety, ranging from such mundane things as detecting fraudulent checks to studying rays that cure rickets; from investigating the properties of ultraviolet transmitting glass to enlarging the frontiers of pure science. Dr. Stockbarger was graduated from the Institute in 1919, joined the instructing staff in 1920, and received his doctor's degree in 1926.

WITH this issue DANIEL C. SAYRE makes his introductory bow as a contributing editor to The Review, joining Professor Tenney L. Davis, '13, and Mr. W. P. Cutter. Professor Sayre will contribute articles on aviation. As an Assistant Editor of *Aviation* and as an Associate Professor of Aeronautics at the Institute, his *bona fides* as a writer on aviation is not to be questioned. Professor Sayre is a member of the Class of 1923 and holds his master's degree from the Institute. He was one of the founders and promoters of the Boston Airport Corporation and he has been active in other ways in the field of air transportation. An article of his on that topic appeared in The Review for May, 1929.

THE water color on the cover of this month's Review was executed in 1929 by Mr. ROBERT C. DEAN on a trip to Europe as a traveling fellow of the Institute. It was made at the Krupp Factory in Essen, Germany. Mr. Dean was graduated from Technology in 1926 and obtained his master's degree the following year. He is now connected with Perry, Shaw and Hepburn, architects, and is also an instructor in the Institute's Department of Architecture. ¶ On page 274 are reproduced examples of a series of 12 murals recently executed by Henry Billings, artist, and exhibited in New York. Designed in the modern spirit, they are intended for modern buildings.

REGAULT, a contemporary of Pasteur and a professor at the Collège de France, won fame in his short life by the elegance and apparent ease with which he presented his scientific lectures. Once when congratulated upon this expository power, he remarked, "Ah, you do not see the steel corsets that I wear when I am speaking." Behind his facility lurked perpetual restraint, the mark of a true scientist. ¶ The incident is recalled by the continual constraint that must be exercised in conducting an interpretative scientific magazine. If such a journal is to be worth its salt, the editorial office must wear a steel corset even though the results of its work be sometimes marked by elegance and facility. It is necessary that every scrap of information be rigorously appraised and subjected to the scrutiny of experts, that mere publicity and propaganda be excluded, that the flood of scientific sewerage be not taken for the distilled water of science. Visitors to The Review office frequently remark about the Gargantuan waste paper basket that reposes beside the Editor's desk. They are told that it is the limbo of the pseudo, a symbol of perpetual restraint.

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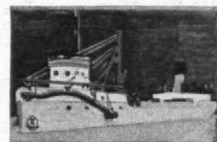
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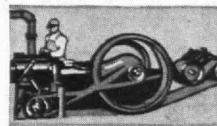
It is possible to illustrate in thumb-nail sketches on this page but a small handful of the G.T.M.'s—Goodyear Technical Man's—successful applications of Mechanical Rubber Goods to production problems in industry. Hardly a process of manufacturing exists, of which he has not practical, profitable knowledge. Hardly a business which may not profit from his wide experience.

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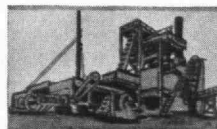
Back of the G.T.M. are Goodyear and vast resources of invention and technical skill. The full resources of *The Greatest Name in Rubber*, the superior design and materials of its products, are opened to you through this trained man. It is reasonable that he can help in your work—that what he knows will save you costs and trouble. Just write to Goodyear, Akron, Ohio, or Los Angeles, California, and ask the G.T.M. to call.



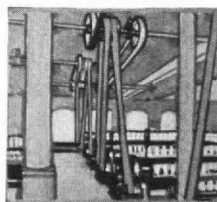
Goodyear Suction Hose as specified by the G.T.M. for rugged service on dredge "Kelly Island"—large bore hose armored internally with flexible metal spiral—typical example of Goodyear product thoughtfully applied to low-cost work in industry



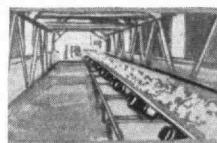
Goodyear Compass (Cord) Endless Belt on compressor—G.T.M.-specified for North Standard Mining Co., Eureka, Utah



Goodyear Elevator Belts—at work in the Rockhill crushing plant of the General Crushed Stone Co., Easton, Pa.—Goodyear Transmission Belting—all specified by the G. T. M.



Goodyear Thor Transmission Belting, seamless, a complete textile-mill installation made by the G. T. M.—Belt structure prevents wear on edges. Goodyear service reduces belting costs on twistlers, spoolers, frames—fine example of increase in plant efficiency following visit of G. T. M.



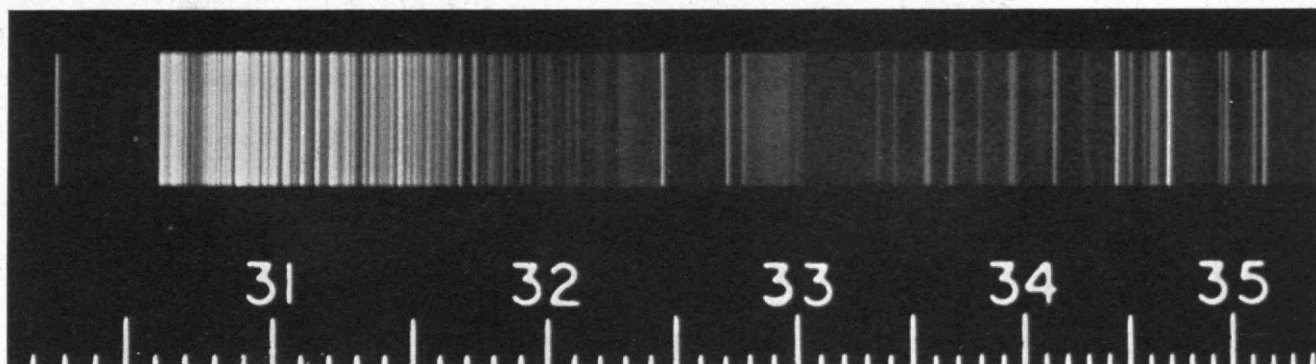
Goodyear Conveyor Belt carrying ore in mine—G.T.M. specified and installed

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SPECTROGRAM OF NEON AND GOLD VAPOR. SEE PAGE 284

# THE TECHNOLOGY REVIEW

*Edited at the Massachusetts Institute of Technology*

VOLUME XXXIII

NUMBER 6

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EDITOR

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PUBLISHER

HAROLD E. LOBDELL

CONTRIBUTING EDITOR

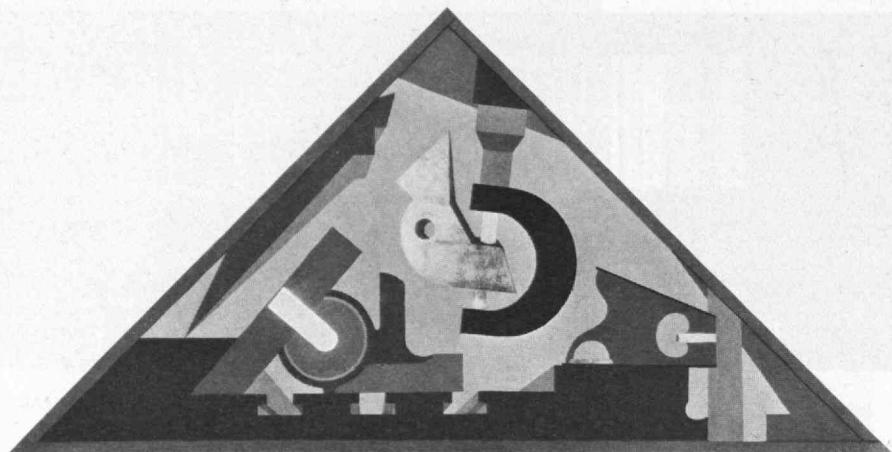
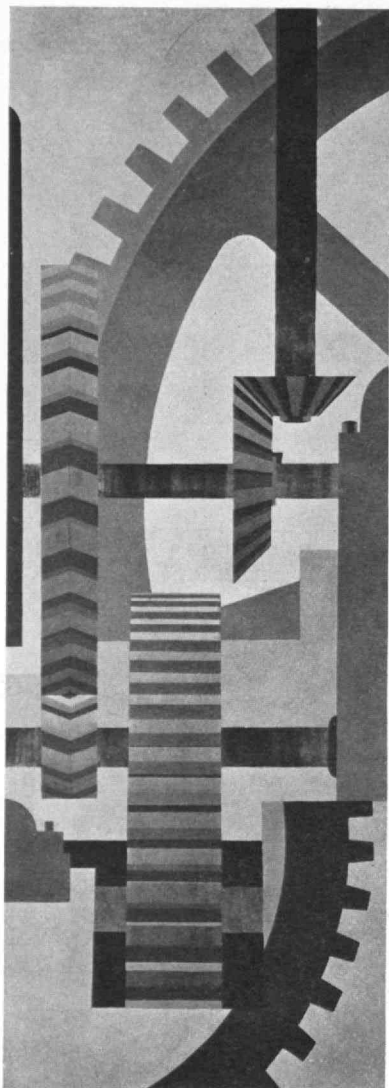
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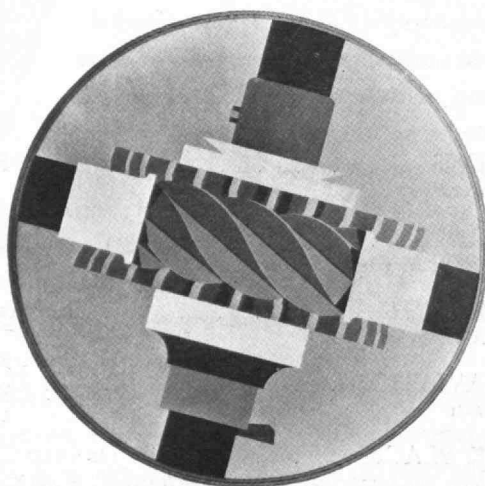
PUBLISHED monthly on the twenty-seventh of the month preceding the date of issue at 50 cents a copy. Annual subscription \$3.50; Canadian and foreign subscription \$4.00. . . . Published for the Alumni Association of the Massachusetts Institute of Technology. Thomas C. Desmond, '09, President; Francis J. Chesterman, '05, George K. Burgess, '96, Donald G. Robbins, '07, Vice-Presidents.

Published at the Rumford Press, 10 Ferry Street, Concord, N. H. Editorial Office, Room 11-203, Massachusetts Institute of Technology, Cambridge A, Mass. Entered as Second-Class Mail Matter at the Post Office at Concord, N. H. . . . Copyright, 1931, by The Technology Review. . . . Three weeks must be allowed to effect changes of address. Both old and new addresses should be given.

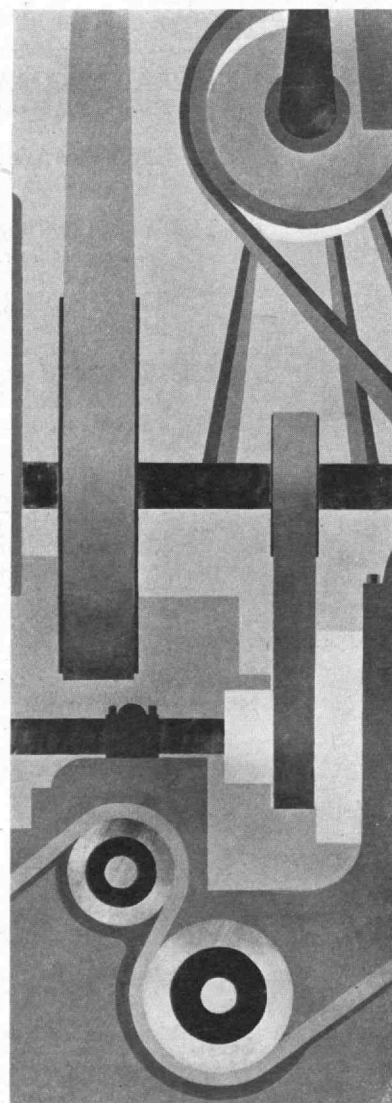
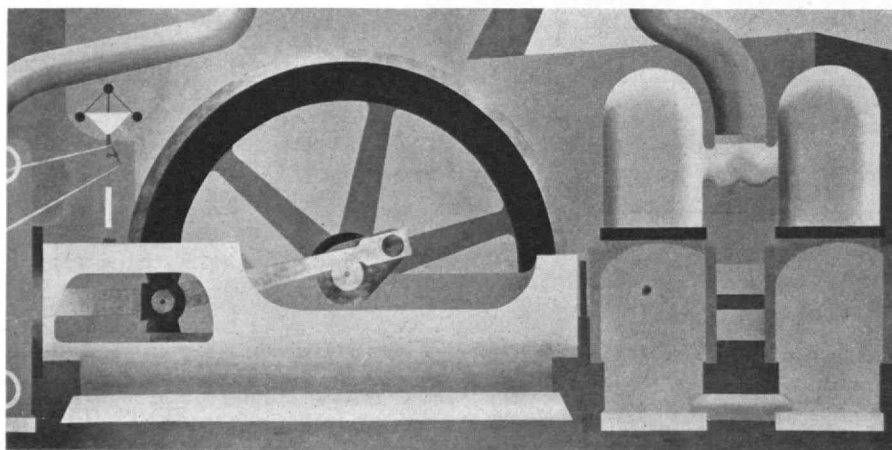


## MURAL DECORATIONS

*By Henry Billings*



*Based Upon*  
MODERN MACHINERY





# THE TECHNOLOGY REVIEW

VOLUME 33

MARCH, 1931

NUMBER 6

## MACHINE-MADE MINDS

*The Psychological Effects of Modern Technology*

BY JOHN BAKELESS

*See Page 266*

ONE would not willingly add another to the innumerable futile laments over the Machine Age — conventional complaints which by this time are merely wearisome. If there were not so much more that is tiresome, there would be something funny about our solemn modern devotees of the æsthetic Greek or Mediæval Past. Seated in Grand Rapids chairs at pressed steel desks in comfortable steel-and-concrete apartment houses (which are, of course, mechanically heated and lighted), in cities which owe their very existence to the machine, they bang out on thoroughly mechanical type-writers their ululations over the passing of the arts and handicrafts — sad victims of the machine, that fell and ferrous monster. (It may be objected that you can't bang out an ululation; but at least the metaphor is no more mixed up than the minds of the writers it describes.)

A little more knowledge of what life in the Middle Ages was like — of the brutality and filth and squalor that accompanied its picturesque charm; a somewhat more realistic comprehension of the seamy side of the attractive life of ancient Greece (in which a Plato could be sold into slavery and an Aristotle could cheerfully consign 90% of the population to the same fate in the interests of the cultured few) would speedily convince even the more aggressive critics of the

machine and its products that a mechanical basis for society is not wholly without advantages. It might even persuade them that the engineer is not necessarily to be equated with the Goth or the Vandal.

There is no longer any doubt that the machine is here to stay. We shall have it to deal with as long as our peculiar type of civilization exists; and it is even probable that the continued existence of our civilization chiefly depends on whether we make a wise or a foolish use of the machine.

It is a curious fact that the writers who have dealt with the social, economic, and political effects of the machine have neglected the most important effect of all — its profound influence on the modern mind. Anything that shapes our thoughts shapes society also; and the effects of the machine on contemporary thought, must, therefore, be at least as significant as its effects on contemporary economics or industry, or the life of society in general.

Even our republican form of government is possible only because a few machines — mainly vehicles (railroads, airplanes, and motor cars) and means of communication (mails, telephone, telegraph, radio, wireless, and machine-made newspapers) — bring the minds of a continent sufficiently close so that we can live and work together. In fact, if we



*Peter A. Juley & Son*

"STEEL-WORKER" FROM THOMAS H. BENTON'S MURALS  
"AMERICA TODAY" IN THE NEW SCHOOL FOR SOCIAL RESEARCH.  
TWO OTHER PANELS ARE SHOWN ON FOLLOWING PAGES



Peter A. Juley &amp; Son

may trust Shakespeare, who certainly was not a product of the Machine Age, "there is nothing either good or bad, but thinking makes it so." If the machine really controls our thoughts, no wonder it controls all else.

But before we begin to worry over the fact that the modern mind is as completely machine-made as any other factor in Twentieth Century civilization, it may be just as well to analyze the effect of the machine upon the modern mind. Some of these effects, no doubt, are bad; but others — this, at least, is not beyond the bounds of possibility — may turn out to be good.

The machine exerts a dual influence over the mental life of modern man. In the first place, to a surprisingly large degree, it controls the subjects of our thoughts and the data on which our general ideas are based. In the second place, it has an almost equally powerful indirect influence upon the individual mind through the subtle influences arising from an environment and a mass psychology which the machine has itself created.

Mr. Stuart Chase, '10, has observed that "the number of those bound intimately to the rhythm of the machine is a small percentage of the total population." This is quite true; but through its indirect influence on our minds, the machine reaches out to dominate the life of every man and woman on the continent of North America.

Consider the mental equipment of the average modern man. Most of the raw material of his thought enters his mind by way of a machine of some kind — often through

the agency of several machines. Newspapers, magazines, moving and talking pictures are the clearest examples.

The newspaper is not only one of the chief influences in swaying the ideas and prejudices of ourselves and our contemporaries; it is also a triumph of machinery and of mechanical organization. It differs immensely from the crude little newsbooks and corantos of the Seventeenth Century, but not because its editors and readers are greatly different from their ancestors who waited eagerly for the latest news from the army of King Charles or the wars against the Turk.

It is different for two quite different reasons: in the first place, the Twentieth Century journalist can collect, print, and distribute his news with a speed and completeness wholly due to a score or more of intricate machines. In the second place, mass production, another result of machine economy, gives the publisher an immense advertising revenue which commercially justifies enormous news-gathering expenditure.

All this creates an almost incalculable difference between the modern mind — the scholar's in his study, the technologist's in his laboratory, the engineer's in the field, as well as the giggling, gum-chewing shop-girl's on her way down town in the subway — and the mind of the Eighteenth or early Nineteenth Centuries. For the first time, thanks to machinery, such a thing as world-wide public opinion is becoming possible.

Thanks to the newspaper, the modern world knows more about itself every morning than the world before the industrial revolution ever knew.

But this increase of self-awareness in the modern world is due to a number of other machine products besides the newspaper. The newspaper directly influences many contemporary books and magazines whose writers derive much of their inspiration, some of their methods, and all too many of their facts from the daily press.

It is notorious that every successful magazine editor is an inveterate newspaper reader. S. S. McClure used to have the leading American newspapers mailed to him, even when abroad; and the present dean of American magazine-makers reads English and American newspapers with the greatest assiduity. The machine's effect on the newspaper is thus carried over into more enduring form. Moreover, the book and the magazine are themselves largely machine-made from the moment the author delivers his manuscript to the editor or publisher. A cynic surveying most popular science and a good deal of popular fiction might easily be tempted to trace machine work even further back.

The rapid advance of pure science and technology, the most obvious single characteristic of our time, is also directly related to machine-production in publishing and the resultant ease, cheapness, and speed in making and distributing technical journals. A contemporary laboratory in Peking, Tokyo, or Calcutta is perfectly aware of the results achieved in other laboratories in Berlin, Paris, London, Oxford, and both the Cambridges. But Chinese scholars of the Chou dynasty did not even know that Athens existed or that Aristotle was lecturing there.

Under such conditions, progress in pure science and subsequent progress in its technical applications was necessarily slow, halting, unsure. One worker could not benefit by what another had done. The intellectual fertilization which results from a free exchange of ideas was impossible. There were many unrelated, feeble lines of advance, instead of one great, steady line strengthened by mutual coöperation.

"With the introduction of printing," says Mr. H. G. Wells, "the intellectual life of the world entered upon a new and far more vigorous phase. It ceased to be a little trickle from mind to mind; it became a broad flood, in which thousands and presently scores of thousands of minds participated."

The changes in our methods of making, reproducing, and distributing printing have had a somewhat similar effect. Art as a creation of hand, brain, and emotion in which the machine has no part is as old as the race. But the original work of the artist necessarily affected few people. The machine has made it possible to distribute fairly good reproductions far and wide at low cost. The machine has also made possible mechanical travel — of which more anon — bringing thousands of people to the galleries in which the great originals are housed, where only hundreds came before.

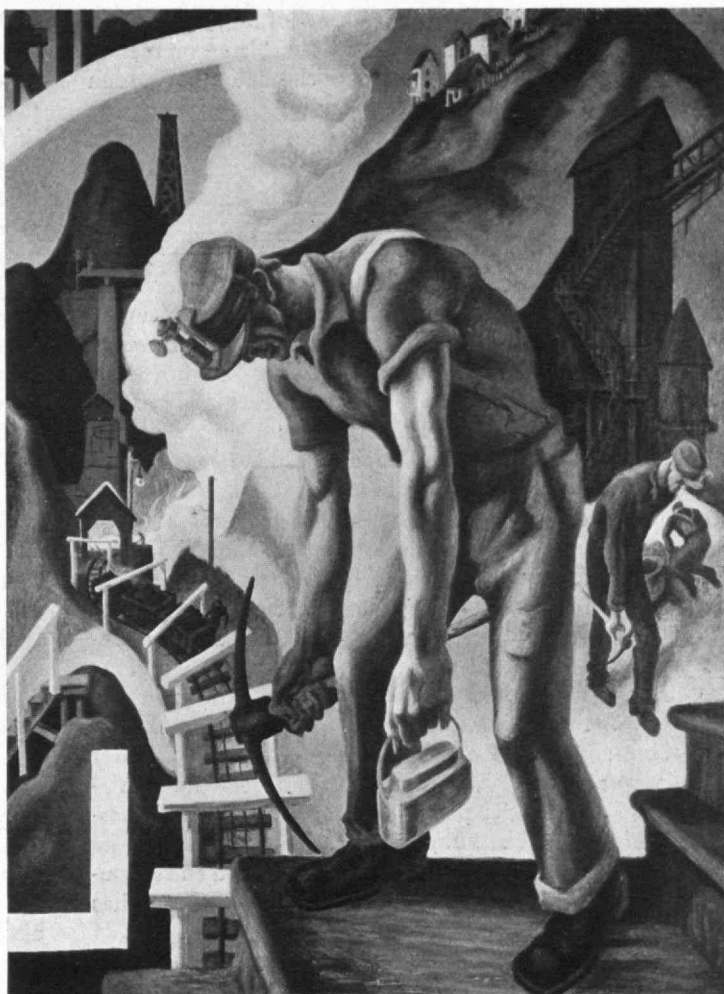
The crude, hand-drawn woodcuts of crimes, wonders, and disasters which adorned the early newsbooks had no more claim to art or accuracy than modern "composographs" in a contemporary tabloid. But in the Nineteenth Century, the camera came into general use and with it photo-engraving and the rotogravure process, making possible the modern illustrated press. Today we do not have to read the news. Even the illiterate can see it reenacted in pictures, still or talking. They can even listen to a mild distortion of its sounds.

Our ideas of foreign lands can be changed overnight with pictures. A modern Othello, spinning yarns

"... of the Cannibals that each other eat,  
The Anthropophagi, and men whose heads  
Do grow beneath their shoulders"

must bring photographs to prove his story and illustrate his lectures or his articles.

The effect of all this on art is curiously dual. Thanks to cheap reproduction, anyone who wants it can study any of the great masterpieces in an accurate photograph. One museum has even set itself the stupendous task of collecting reproductions of all the world's important paintings. The machine is thus a positive benefit. But it has had a very different effect on the progress of contemporary art. When the machine first made the modern magazine possible, the artists at first deserted their exhibitions to embellish the magazines, the result being a really great school of American illustration. This was destroyed when mass production — a result of machinery — led to enormous advertising campaigns and immense appropriations, which lured the artists out of the editorial and into the advertising pages. Many a promising young painter is today drawing pictures of motor cars and razor blades and cans of pork and beans not because he particularly



Peter A. Juley & Son

enjoys it, but because it is infinitely more profitable than *l'art pour l'art*.

At the same time, the machine has found another use for art. The factory, which has long employed the artist — sometimes to strangely little purpose — as a designer of paper and textiles, is now reaching out for him as a designer of the most grotesquely improbable products. Not long ago the Westinghouse Company took an instructor from the Carnegie College of Fine Arts to add aesthetic quality to its products. It also sent its engineers to art classes. It had discovered that sound artistic and sound mechanical design tended to approach each other.

Thus, even while interfering with the purely creative work of the artist, the machine is beginning to surround us with agreeable objects of harmonious design — without the special charm of handicraft, no doubt, yet often with a new quality almost worthy to replace it. Sometimes, indeed, the artist turns to the machine for his ideas. And always, silently and subtly, the machine goes on transforming the mind of the modern world.

Quite as significant as the machine-made power of the press and of mechanically reproduced art upon our minds, are the various mechanical devices developed during the last two decades for pouring ideas into our eyes and ears — movies, talkies, radio, and television. Some of these mechanical devices probably have more effect upon the less literate levels of modern society than the printed word could ever hope to have.



ONE may, according to one's view of life, regard this state of affairs as dismal or desirable — or merely funny. The point here is only that the machines which produce this attitude are largely shaping the minds of the coming generation and, in less degree, the minds of the present generation. Even when we seek the allegedly broadening effects of travel, we moderns depend on the machine. In Europe, "tourisme" has become a major industry, enjoying the favor and protection of the state. It is an affair of advertising and organization, steamships, railroads, and motor cars. It is, in short, very much a part of the Machine Age. But it is an open question whether the modern, personally conducted tripper — who, with his ticket two yards long, is whirled breathlessly about the continent of Europe in six weeks — broadens his mind at all. One may even doubt whether anyone originally possessed of a mind would undertake such journeys. Certainly the bustling modern tripper does not broaden it a tenth as much as the English "milord" of the Eighteenth Century, who with his horse and chaise, in decorous leisure, made the "grand tour" of France and Italy; and whose desultory means of travel perforce compelled him to learn the country and its ways.

Only the favored few traveled in those days; but to judge by the urbanity of Eighteenth Century society, it did them some good. Today, the profiteers make their appointments at St. Moritz or the Lido instead of Toronto or Palm Beach, and all the deacons of America assemble nightly at the Folies Bergères. But if all this does anyone any good (except the hotel keepers and the steamship lines — operators of floating machines) no one has ever found it out.

Incidentally, since the machine has reduced most industrial countries to a flat uniformity, it is very nearly impossible for the traveler to find local color nearer than the Balkans, except where the inhabitants are ordered to be conscientiously picturesque for the benefit of the tourist industry. All this is the machine's doing. Machines transport the tourists. Machines produce the wealth to pay their bills.

The machine is also responsible for the transition from urban to industrial civilization. The time may be approaching when even the farm will be industrialized. If the Soviet agricultural experiment succeeds in Russia, the capitalistic countries may be compelled in self-defense to industrialize their own agriculture. We shall then substitute for our farms, "food factories," which will be very much more "efficient." That is, having already more farm products than we know what to do with, we shall add to their amount; and the privilege of premature demise from overeating will become less expensive and even more widely enjoyed than it is today. To offset these doubtful merits, something precious will go out of life, particularly out of the life of childhood, which will not be without its own ultimate effect.

Agriculture is a way of life which influences the whole of civilization. As Socrates once observed, it "gives strength to the body and hardihood to the soul" and is responsible for "the best citizens with the best understanding." Contemporary society could very well do with a little more of all these qualities; but whether mechanized agriculture, the ultimate triumph of the factory, will do much to enhance them, we may very reasonably doubt.

Worst of all, mankind will lose touch with its humble brothers of the lower creation. The machine is already driving animals out of human life. Horses have not completely vanished, but they have become luxuries, instead of familiar daily friends. Oxen, slow-plodding and picturesque, disappeared long since. Eggs, milk, and honey reach most of America's population nowadays with no more indication of their animal origin than a glass bottle, a tin can, or a cardboard case.

Now, odd as it may appear, this can hardly be without effect on the mind of modern man. Man and the animals have lived together almost from the beginning, perhaps from the day when a wolf cub was brought into camp to grow up as the first dog. Even before that, animals were gods and totems and blood-brothers of primitive man; and at the very least, they were his chief source of food and clothing.

The effects of man's severance from the lower creation and his new dependence on machines will probably be clearer in the next generation, the generation who now are children. Somehow, a boy and a dog have belonged together from time immemorial, and other animal pets and fellow workers have always been plentiful. Earlier generations in childhood dealt habitually with sentient creatures, not with unresponsive metal objects. In caring for them, they unconsciously developed a good many social virtues: a sense of responsibility; a sense of justice (if you punish a dog unjustly, your conscience will hurt you more than if you steal a dozen Ford cars); gentleness; sympathy. Of course, it didn't work perfectly; but there must certainly have been a general development, however unconscious, in every mind of capacity for certain virtues that human society badly needs. For genuine ethical influence, a really good dog is hard to beat.

It is painfully easy to sentimentalize over this sort of thing, and very difficult to make it seem concrete; because, in fact, it isn't very concrete. It is only real.

Walt Whitman, in "The Beasts," a poem that has been quoted very nearly to death, expressed it as well as any body can:

"I think I could turn and live with the animals, they are so placid and self-contained;  
I stand and look at them long and long.  
They do not sweat and whine about their condition;  
They do not lie awake in the dark and weep for their sins;  
They do not make me sick discussing their duty to God;  
Not one is dissatisfied — not one is demented with the mania of owning things;  
Not one kneels to another nor to his kind that lived thousands of years ago;  
Not one is respectable or industrious over the whole earth."

You simply cannot write that kind of thing about the finest tractor ever designed.

NOT only does the machine directly determine the thinking of adults while subtly shaping the minds of the generation that will replace them; it also creates the environment in which we do our thinking. Here, again, it is easy to exaggerate an effect which is at best impalpable. But it is surely easy to see a relation between the mechanical nature of modern art and thought and the mechanical environment. The chief example before child and adult is the frenzied competition (*Continued on page 298*)

# Fifty Pfennigs' Worth

## *The Great Industrial Museum in Munich*

BY HARRY J. CARLSON

See Page 266

IT TAKES FOUR HOURS TO WALK  
RAPIDLY THROUGH THIS NEW  
DEUTSCHES MUSEUM IN MUNICH

Galloway



LAST summer I heard of a bridal couple who, on an all too short honeymoon, visited the Deutsches Museum in Munich and spent three happy days pushing the buttons that started machines. Anything that would bring these starry-eyed wanderers back to terra firma for that length of time must be worth seeing, and so, just as the "donkey went to Bremen," I started for Munich to see what the Deutsches Museum had to offer.

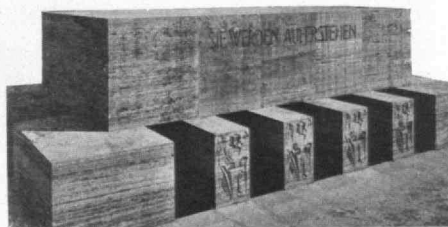
In the first place, the approach to Munich is most interesting. Surrounding towns like Neumarkt, Nördlingen, Ingolstadt, Regensburg, and even the more commercialized Oberammergau are all unspoiled relics of mediævalism, but Munich itself is an ultra-modern city of 700,000 inhabitants. The startling beauty of its new War Memorial, the great housing developments, the clean, well paved streets all attest to the city's enterprise and culture. The city occupies a great plain, looking off to the mountains of the South. The Museum, a huge building of three and four stories covering about nine acres of floor space, is located on the Museum Insel, one of the two long islands in the River Isar that separate Munich into two parts. The Museum is organized with the thoroughness that one expects of German scientists. It is divided into the following departments: administration, business office, new building, science, technology, industry, library, and workshop.

Bacon's motto, "I have taken all knowledge to be my province," might well be carved over the

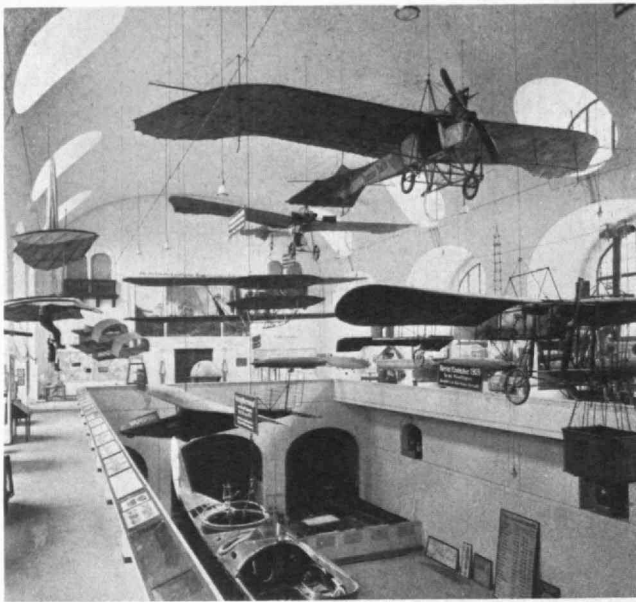
central portico. The high vaulted hall of fame in the second story gives a further idea of the breadth of the Museum's program, for here we find monuments of Goethe, and portraits or busts of such men as V. Humboldt, Frederick the Great, von Guericke, Leibnitz, Fraunhofer, Helmholtz, Gutenberg, Ohm, Krupp, Siemens, Copernicus, Kepler, Liebig, Bunsen, Lilienthal, von Zeppelin, and many others.

Space allows me to describe in detail only a few of these departments. Geology seems to be a natural beginning. We start with descriptive exhibits of the structure of the earth, its strata as represented by huge sections, and its raw materials of technology. From these exhibits it is but a step to the models showing the influence of water, ice, and wind on the earth's surface. The action of volcanoes and earthquakes is made clear as well as the origin of mountains and a large schematic section of the earth is presented showing the sedimentary layers and their corresponding fossils.

In adjacent rooms are depicted the search, production, and utilization of useful minerals. Portions of actual mines are presented with startling realism. Mining machinery, ore dressing by wet, mechanical, and electromagnetic systems can be operated by the visitor as can the jiggling machines, shaking tables, and appliances for amalgamation and roasting processes. These mining exhibits date from the earliest times and methods and show their development into the most modern.



MUNICH'S WAR MEMORIAL TO THE UNKNOWN SOLDIER



THE HISTORY OF FLIGHT, FROM FLYING REPTILES TO THE LATEST AIRSHIPS AND AIRPLANES

The metallurgical department shows the production of lead, copper, zinc, mercury, iron, steel, and other metals.

The next group of exhibits shows the treatment of metals (from old to modern times) by casting, forging, and machine tools. Practically all of the machines can be set in motion by the observer. The foundry shows the processes of moulding, smelting, and casting. Hammers are exhibited operated by hand, water, steam, and compressed air. A model rolling mill shows the fabrication of sheet iron, rails, tubes, wheels, chains, and so on, together with machines for sawing, cutting, turning, milling, and grinding metals. There is a display of methods for testing and assaying metals and finally an exhibition room of fine castings, forgings, and coins.

Each department is arranged with the same completeness of detail as this first one devoted to mining, smelting, and metal working. Every department like it is arranged historically and in every place where it is practical machines on exhibition are so devised that the student observer can operate them by pressing a button. Others are started by an attendant.

Perhaps the department that presents the best examples of operating models is the power department which shows the development of prime movers. First there are the muscle power engines such as treadmills and horse-gears; then come windmills and steam engines, with a copy of Watts' first beam engine of 1788. There is a model of the first high pressure engine with an oscillating cylinder and a water-tube boiler of 1840; a replica of the first Corliss engine in Germany; ship engine models with multiple expansion by Schichau; and copies of

locomobiles and steam turbine (Laval and Parsons). Then come steam boilers, hot air, gas, oil, and benzine motors, and special machines by Ericsson, Lenoir, Otto, and Diesel.

In the department of land transportation, samples of skates, skis, and stilts show the methods of foot-travel. The next group displays vehicles such as sedans, sledges, and carriages, including the gala coach and sled of King Ludwig II of Bavaria and some of the first models of automobiles. Cugnot's steam tractor, Serpollet's first steam road carriage, Benz's benzine motor, Daimler's petrol auto, the "Protos" car which won the first round-the-world prize in 1908, and Rumpler's first stream line car of 1921 are all represented in this group.

Then in another department is shown the development of the railway. There are full size models of the first locomotives (Puffing Billy of 1813) and other reproductions from the Rocket to the ultra-modern type which include expansion cylinders, superheaters, sleeping cars, air brakes, and so on. There are also exhibits from the first electrical locomotive by Werner v. Siemens, 1879, to the latest electrical train with full equipment.

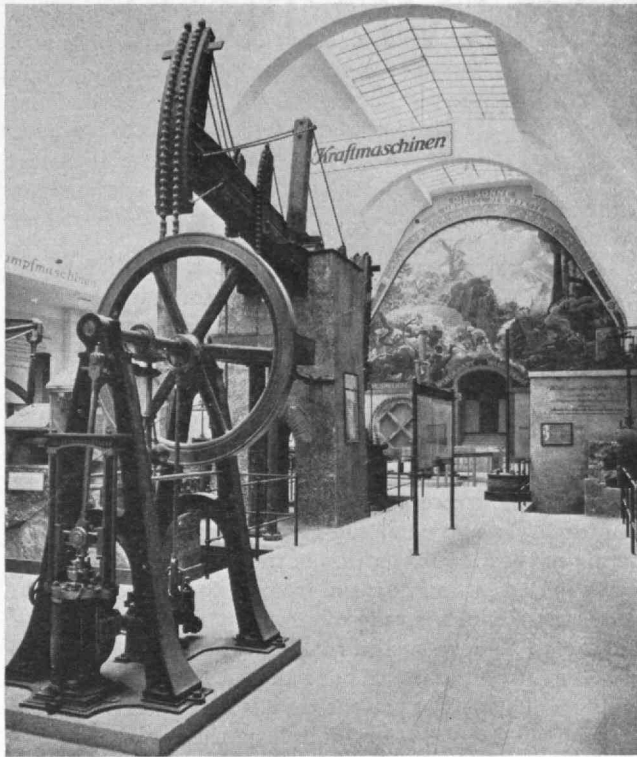
This study of transportation leads naturally to the next department of road building where replicas of ancient Roman roads, German planked roads (dating back to 800 B.C.), mediæval mud roads, and model sections of old and new streets in German towns are exhibited. There are models of railroad construction (surface, under-ground, and elevated), mountain railways, rope railways; and models and appliances for tunnelling and bridge building. A study of hydraulic engineering displays replicas of mountain streams and river correction, ship locks and ship elevators, and models of the Rhine, Main, Danube, and Panama Canals.

The department of harbor operation shows miniature representations of the great harbors and basins of Bremen and Hamburg with beacons, buoys and signals above and below water; while in the department of ship building



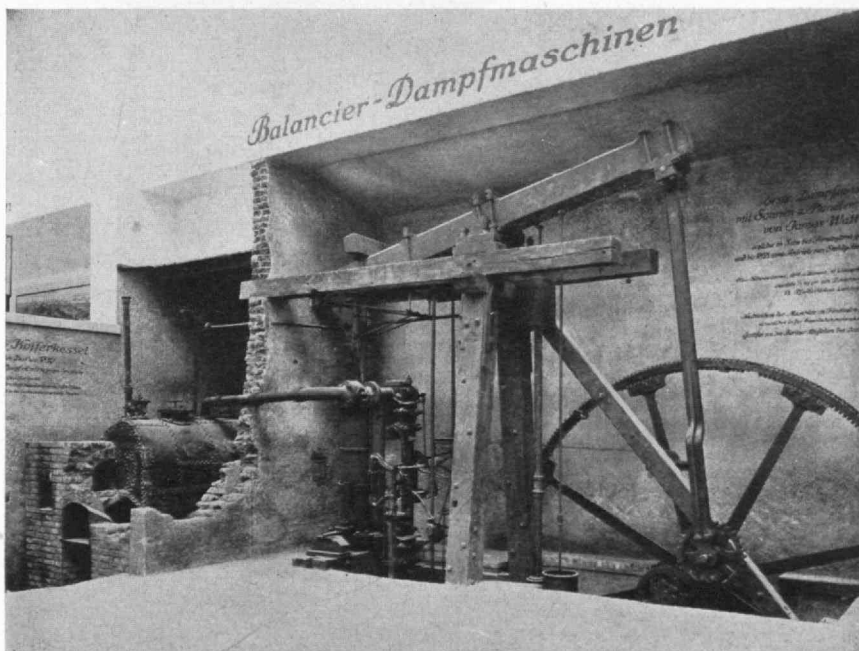
MODEL POWER PLANT IN THE EXHIBIT OF THE EVOLUTION OF WATER-CONTROLLING MACHINERY





WATER AND STEAM POWER MACHINERY IN THE HALL OF PRIME MOVERS

there are models of outrigger canoes, kayaks, and dug-outs. There are also models showing the evolution of rowing and sailing vessels and many duplicates of steam vessels including the *Charlotte Dundas* of 1801 and the *Leviathan*. There are also reproductions of battleships and submarines from the Fulton boat of 1798 to the modern U-boats equipped with torpedoes and mines. One alcove shows the development of the marine compass from the dry to the floating and electric gyroscopic



ONE OF THE 60,000 DEVICES: A REPLICA OF ONE OF JAMES WATT'S STEAM ENGINES. PHOTOGRAPHS BY COURTESY OF CHICAGO MUSEUM OF SCIENCE AND INDUSTRY

compass of today. This department may well be supplemented by a visit to the Oceanographic Museum in Berlin.

One of the most popular departments is that of flight, of which illustrations are given adjacently.

The department of mathematics and physics has an interesting exhibition of instruments for measuring time (sundials, hour glasses, water and oil clocks); of implements showing average time, solar time, the rise and setting of the sun and moon, position of the planets, and so on. There are many beautiful watches and clocks, including the very cumbersome saddle watches of 1550 and the modern flat watch.

Another department shows the various measures of length, volume, and weight. Then follow a series of mathematical devices such as calculating machines, planimeters, compasses, and pantographs. There are also many drawings showing the evolution of descriptive geometry. Reproductions illustrating the development of the lever principle and the inclined plane, pendulum laws, gravitation, gyroscopes and their application are found in the division of mechanics.

A large alcove is devoted to the fundamental laws of hydrostatics and hydrodynamics, and to the mechanics of gases, with the original v. Guericke's air pump and his Magdeburg hemispheres on display. The study of heat and the laws of energy show the different methods of measuring temperature, the development of thermometers and calorimeters. Then there is apparatus for liquefying gases, accompanied by Linde's original machine of 1895, and also by a model of Rumford's famous gun barrel boring showing the transformation of work into heat.

In the section devoted to electricity and magnetism there are found such interesting machines as v. Guericke's sulphur ball, the electrical machine with battery of jars used by Ohm, and the original tubes of C. W. Röntgen. In this department are popular booths demonstrating the Röntgen treatment where an attendant sends rays through visitors' hands and purses. Mme. Curie is represented by a copy of the apparatus she used in her study of radio-activity.

In the telegraphy and telephony section there is an exhibit of telegraph instruments made by Sömmering, 1809, Steinheil, 1836, Morse and Siemens, and also telephone apparatus by Reis 1863 and Bell 1876. There are models of an exchange and of the more modern automatic exchange. Original instruments by Feddersen, Bezold, and Hertz showing the original oscillators, resonators, parabolic mirrors, with which Hertz proved the propagation of electrical waves, were displayed in this section. In the cases are innumerable condensers, self-induction coils, spark transmitters, coherers and crystal detectors, valve receivers, amplifiers and aerials, and daily demonstrations of broadcasting by telephones, and loud speakers are given. (Continued on page 302)

# REVOLUTIONARY AVIATION

## *Introducing the Gyronauts*

BY DANIEL C. SAYRE

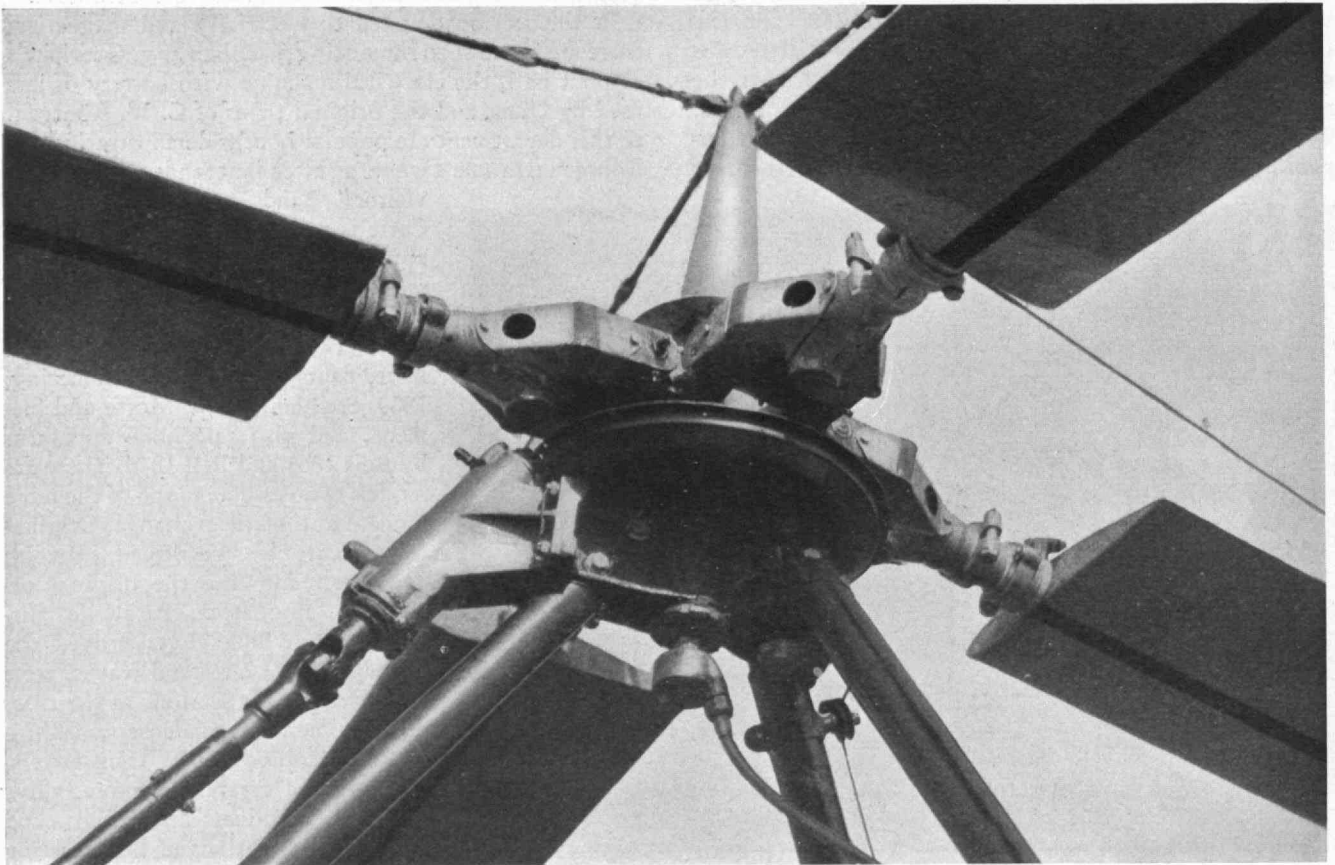
*See Page 270*

THE idea of flight sustained from rotating vanes is by no means new. The incomparable Leonardo is said to have built a successful model of a helicopter, and it is a simple thing to achieve in toy sizes. Other great inventors, among them Edison and the elder Berliner, have considered it the ultimate in aircraft. Nevertheless, a full-sized, pure helicopter is an extremely difficult problem. Reliance on lift from ordinary propellers directly driven from an engine, introduces gyroscopic forces, instabilities, and difficulties of control which are almost insurmountable. True, many such machines have been built and a number have achieved flight, if flight can be defined simply as ascent and a return to earth. The approach to controlled flight of any practical magnitude has been at best remote.

The autogiro is a horse of quite another color. In 1920 Juan de la Cierva, Spanish aeronautical engineer and mathematician, began the development work and in 1923 made his first successful flight. Since then continuous improvement has been achieved in a number of succeeding designs until at last, even the pilots of airplanes are growing interested.

The general appearance of the craft is familiar to all readers of rotogravure sections. An ordinary airplane fuselage with engine and propeller, a wide landing gear, and a small low wing characterize it. All the usual airplane control surfaces are present, and are rather large. Above the ship pivoted about a mast, are four vanes which look like nothing so much as a wind mill. These blades are *not* driven by the engine in flight. The giros, before the most recent type, taxied around the field like an ordinary plane until the blades started rotating due simply to the forward motion of the ship. The rotor turns about 100 r.p.m. in flight and from 60 to 80 r.p.m. is considered necessary for take off. At first it took plenty of taxiing to achieve such a rotation. The early autogiros landed in a short distance but required an extremely large field for take off. The present models now start the blades through a hand-operated clutch from the engine. The run on the ground is, therefore, quite short.

The rotating blades exert a lifting force, which contributes to the total lift of the plane during forward flight and which makes possible the extremely slow landings. Descents can actually be made almost vertically from at



*Autogiro Company of America*

SHOWING THE CONSTRUCTION OF AN AUTOGIRO ROTOR HEAD

least 500 feet at a rate slower than the descent of a man in a parachute. The rotation during the descent is by no means entirely derived from momentum. As the resultant wind velocity past the blades departs from the horizontal, the resultant pressure on the blade section makes an angle with the vertical, pointing forward in the direction of rotation. The craft can, of course, also be brought in on an orthodox airplane glide at very low speeds.

The fastening of the blades at the mast is undoubtedly the kernel of the invention. They are articulated about two axes, are free to rise and fall like the ribs of an umbrella, and to change position in the horizontal plane like those of a fan. True, the blades are kept from collapse on the ground by individual cables running to the top of the mast and there are horizontal cables attached to spring mechanisms which preserve the plan pattern within a few degrees, but in flight the position of the vanes is determined by a resultant of gravitational, aerodynamic, and centrifugal forces. The results are several and highly desirable. The lift on the forward moving blades is larger than on the retreating ones because the resultant velocities are greater, therefore they rise. This, however, introduces a vertical component and decreases the lift through decreasing the angle between the resultant wind and the blade section. The opposite, of course, occurs on the retreating side. There is thus a balancing of forces as each vane passes around the mast. Secondly, the articulations completely eliminate gyroscopic forces. The autogiro can be banked and turned at least as easily as the ordinary airplane. Lastly the bending moment at the pin is made zero thereby reducing the design stresses.

Strangely enough, the resistance of this complex beast is not much greater than that of the corresponding airplane of similar power and payload. The early autogiros were slow; so slow in fact that they fitted one airplane designer's famous question, "If you are just going up for the view, why not build a tower?" But the present models have a top speed in the neighborhood of 120 m.p.h. and carry three passengers. Their proponents are planning racers and trimotored transports. There are no theoretical reasons why they should not succeed.

The things are quite easy to operate; about the same as an airplane. Those who are already pilots have no difficulty whatsoever. Instruction from scratch should be even a little shorter than for the plane. The controls in the cockpit are exactly those of the ordinary joy stick, with the addition of a clutch and brake for starting and stopping the blades on the ground. If there is any operating defect, it is that there can be no recourse to the engine within about 50 feet when approaching a landing in a steep descent, because the controls have lost a great deal of their effectiveness, even in the (Concluded on page 307)



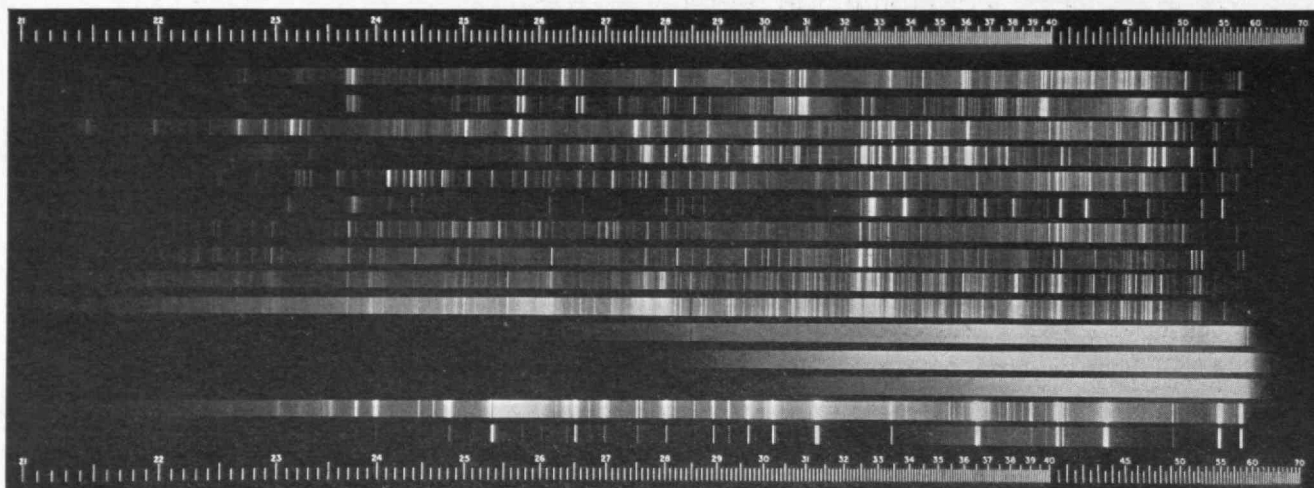
Autogiro Company of America

AN AUTOGIRO IN FLIGHT OVER PHILADELPHIA

#### A DEFINITION AND A DISTINCTION

*THE autogiro and the helicopter are similar in that they are both supported by rotating lifting surfaces. They differ in that the blades of the helicopter are directly driven from an engine while those of the autogiro are not connected to an engine during flight.*





THE SPECTROSCOPIST LOOKS UPON THESE SPECTRA AS PATTERNS CHARACTERISTIC OF THE RADIATING ATOMS

# LIGHT FROM DARK PLACES

*And How a New Machine, the Synchronous Motion Spectrograph, Photographs 15,000 Spectra a Second*

BY DONALD C. STOCKBARGER

See Page 268

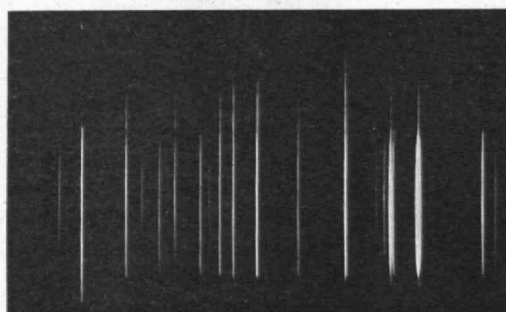
WITH Sir Isaac Newton acting as *accoucheur*, the science of spectroscopy was born in 1666. The world well knows the story of how he decoyed a sunbeam, passed it through a prism, and obtained the colors of the rainbow. It was an experiment no less simple than it was epochal. In fact, it was one of the most seminal experiments in the history of science, for it has led man into a new world of physical discovery.

The prism that broke up white sunlight into rainbow colors for Sir Isaac was an elementary form of what we now term a spectroscope, a device able to break up light into its spectral parts. In its various forms (one of which, lately built at the Institute, is described below), the spectroscope has become one of the greatest of the tools of science, yielding secrets about chemical compounds otherwise undiscoverable, reaching out to the stars, breaking into the atom, showing the kinship of the infinitely large with the unbelievably small. Little wonder that the Institute is building a great spectroscopic laboratory as a part of its new plant for physical and chemical research, spectroscopy being

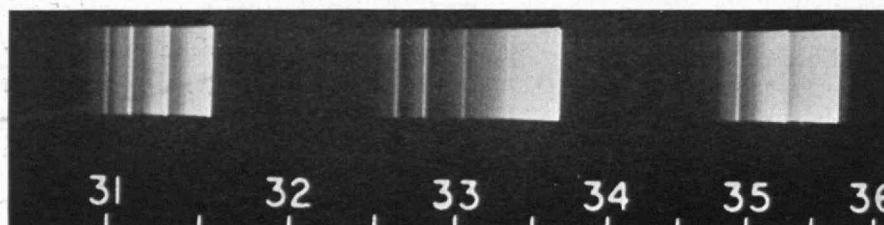
equally valuable to both the chemist and the physicist.

The spectroscope, in fact, has been partly responsible for effecting a new and fruitful alliance between the different branches of science which once were considered separately. It is only by their joint action that scientific knowledge and technique improves so rapidly, that we have better lights for our homes and factories, new methods of producing chemicals, more sensitive photoelectric cells for controlling an ever-increasing number of industrial processes, better vacuum tubes for our radios, therapeutic lamps for our homes and hospitals, more pleasing motion pictures, and a host of other things.

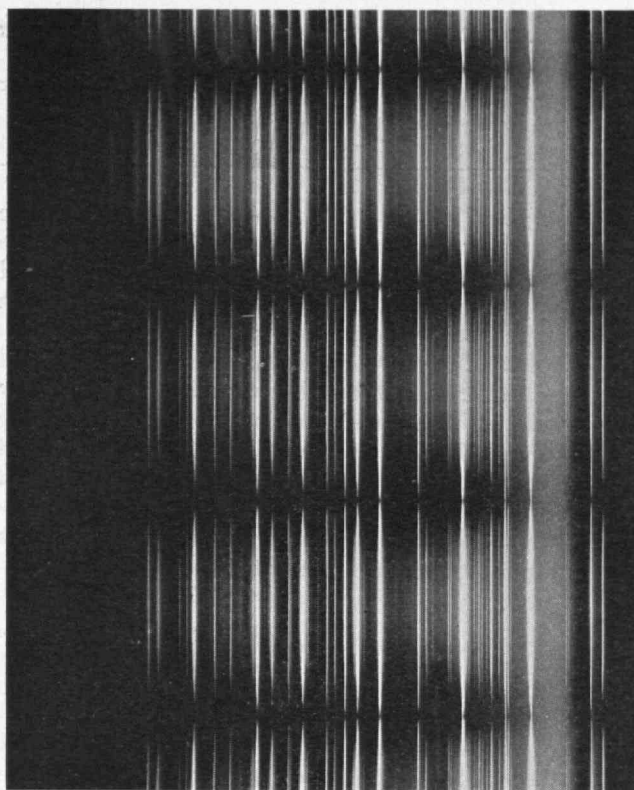
Although some spectroscopes are used as Newton used his, that is, for the visual examination of light, the majority now employ photographic or electrical means of detecting light. If, for example, the eyepiece of a visual spectroscope were to be replaced by a camera, we should then have a spectrograph capable of photographing not only the visible spectrum, but also parts of the invisible infrared and ultraviolet spectra as well. Spectrograms, the photographs taken with such instruments, are



PHOTOGRAPH TAKEN BY SYNCHRONOUS MOTION SPECTROGRAPH



EXAMPLE OF A BAND SPECTRUM



SPECTROGRAM OF TUNGSTEN MERCURY ARC IN QUARTZ TAKEN BY SYNCHRONOUS MOTION SPECTROGRAPH

generally made whenever it is possible, for printed records are of much greater value than mere memories. They permit leisurely examination which is not always possible with a visual instrument, owing to the short duration of the spectrum.

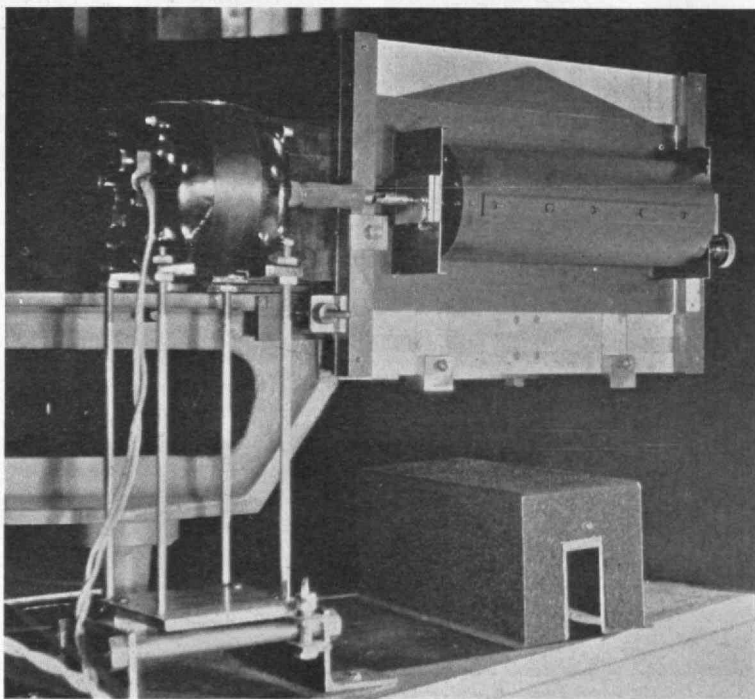
Of the many methods which can be employed to produce the spectrum of a substance, perhaps the simplest is to place the material in a hole drilled in the end of one of the electrodes of a carbon arc. When the arc is lighted, the heat vaporizes the material; and the vapor, being formed in the arc itself, becomes electrically excited and therefore radiant. As a rule, the arc lines are so well fixed in position that the spectroscopist looks upon the spectrum as a pattern characteristic of the radiating atoms. This being so, if we were to send samples of gold to spectroscopic laboratories on opposite sides of the globe to have independent studies of the gold arc lines made, we might reasonably expect that two essentially identical reports would be forthcoming. It is to be expected that not only would the spectral patterns obtained by the laboratories look alike, that is, have the same number of prominent lines in any given region, but they would really be identical in that the individual lines would occupy the same positions in the two cases. So definite are the positions that certain readily measured lines are accepted as standards in wave length determinations.

There are, however, exceptions to these rules, and, as is so often the case, the exceptions prove to be of great importance. When the light from a

star is examined spectroscopically the patterns of the different elements, superimposed on the photographic plate, of course, may be found to be shifted bodily toward either the red or the violet end of the spectrum. Stated otherwise, the wave lengths may all be too long or too short. If they are too long, the astronomer may conclude that the star is receding from us; if too short, that it is approaching us. Moreover, from the amount of the displacement he even calculates the star's speed along the line of sight.

Whether or not there is a displacement of the lines, the star's spectral pattern may be very remarkably altered in appearance from what we should expect on the basis of our everyday laboratory experience. Irregularities appear, the most notable of which is possibly the absence of ordinarily observed lines of elements known to be present in the star. From such apparent defects the astronomer is able to compute the temperature of the star, and it is interesting that these computations lead to estimates which agree fairly well with figures obtained otherwise. High temperature has such a profound influence that in extreme cases certain elements may be unable to emit any detectable radiation, and consequently, paradoxical as it may seem at first thought, complete absence of lines of an element in a star's spectrum does not necessarily indicate that that element is missing.

This is not the case in the laboratory, however, for here we can easily control conditions to insure obtaining a spectrum of practically any element which we wish to study. The chemist makes use of this fortunate situation in spectroscopic analysis with which he can detect quantities of elements so minute as to remind one of the old problem of locating a needle in a haystack. But he has not stopped at that. He has joined forces with the physicist to attack problems of very different natures. Together they are looking into the constitution of atoms and molecules, and thus not only (*Continued on page 306*)



SYNCHRONOUS MOTION SPECTROGRAPH



## THE TREND OF AFFAIRS



### *Direct Versus Alternating*

IN THE early days of electrical engineering, electric power was generated, distributed, and used in the form of direct current. The worm turned, however, and alternating current almost entirely displaced direct. This ascendancy of alternating current was the result of its quality of being easily changed from high to low voltage or *vice versa*, by means of transformers, direct current not then being amenable to such modification.

Will the worm turn again? At least part way, if a new device developed by Dr. Hull of Schenectady lives up to its present promise. This instrument, the thyatron, is capable of doing for direct current what the transformer does for alternating. Deriving from a study of the discharge of electricity through gases (one of the most fertile divisions of modern physics), the thyatron is a close relative of the well-known vacuum tube. Its output current may be started, stopped, and varied by minute quantities of power. In certain characteristics it is a million times more sensitive than the ordinary vacuum tube, and it can be designed to carry 100 amperes at 20,000 volts. It acts more swiftly than a relay, and its efficiency in high power operation is approximately 97%.

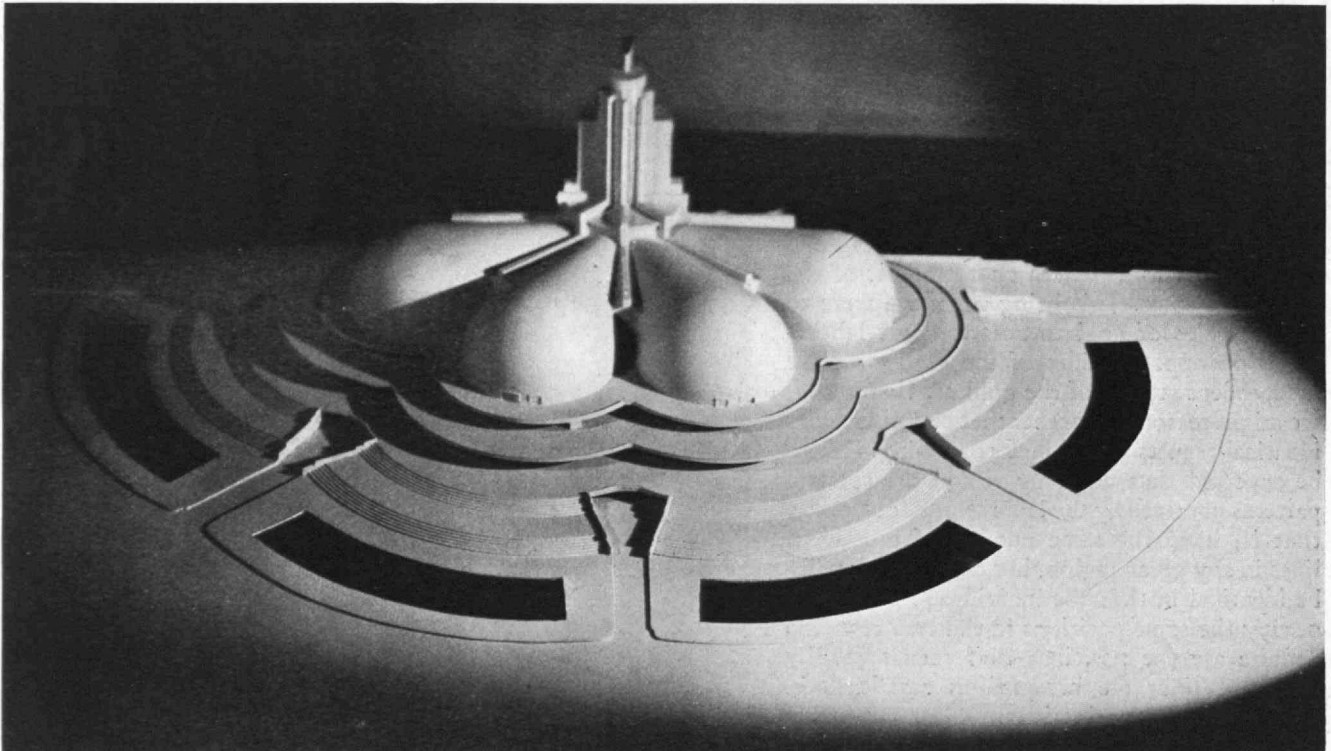
The promise that lies in the future perfection of the thyatron tube is that it would make possible improvement in the stabilization of long distance alternating current power systems; existing alternating current lines

could be joined by direct current links, and long distance high voltage transmission of direct current would be possible with consequent increased carrying capacity and efficiency of transmission lines. The time may come when power produced by alternating generators will be converted to direct current for long distance transmission and delivered to the consumer as direct current or inverted by the thyatron tube to alternating current. Generating stations would become fewer and larger and the benefits of cheaper electricity would be extended to new fields of opportunity. It may bring to a close the *bellum internecinum* over the relative merits of alternating and direct current for the electrification of railroads.

### *Turning Poison Gas into Hair Tonic*

THE ideal, if not the practice, of beating swords into plow shares is a common one. The metaphor, nevertheless, is an anachronism and on the basis of recent news it might be modernized by changing it to "turning poison gas into hair tonic." Such a change is highly to be desired, not only in the interest of rhetoric, but for the sake of those whose pates are bare, or in loftier language, in just recognition of what war, peace, and science are doing to curb parietal depilation.

The simple truth is that "mustard gas" or dichlorethylsulphide, as it is more felicitously termed, may be an efficient promoter of hair growth. The *Journal* of the



Maurice Goldberg

A PROJECTED TEMPLE OF MUSIC DESIGNED BY NORMAN BEL GEDDES FOR THE CHICAGO WORLD'S FAIR IN 1933. IT HAS A SEATING CAPACITY OF 10,000



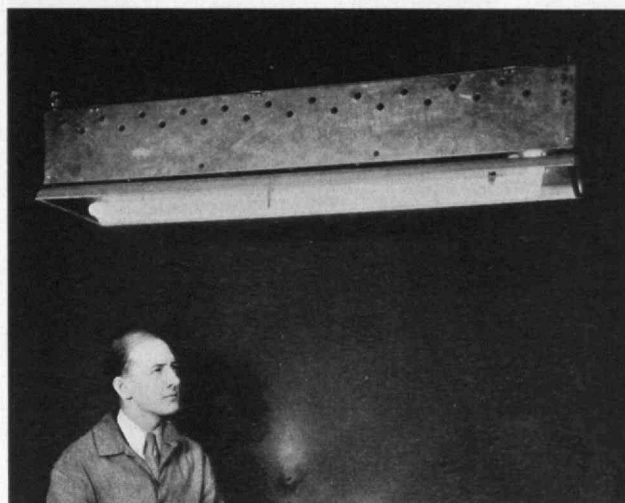
American Medical Association reports that "dichlorethylsulphide in high dilution was the most efficient hair growth promoter of a considerable number of agents tried. Quantitative estimations of hair growth on shaved cats, treated locally with concentrations of 0.01% of the compound in 50% alcohol containing 2% of glycerin, showed a much greater production of hair than with tincture of cantharides, 1% mustard oil, and ointment containing 33% of cholesterol, a hydrolysate of hair, tincture of cinchona, and certain proprietaries containing the so-called hair ferment and other constituents. The hair grew not only more abundantly but also longer than in the untreated control areas. Impure yellow petrolatum, but not the pure white product, was next in efficiency to dichlorethylsulphide, this being attributed to impurities acting as irritants."

The *Journal*, however, points out that the results of hair tonics on cats should not arouse premature hopes in bald humans, since all shaved and bald skins do not respond equally well.

### *A Universal Law of Nature*

THE law of gravitation, that matter attracts matter, is a law of wide application for it applies throughout the material world to all kinds of gross matter in any kind of a situation. There are laws of still greater generality which apply to material and immaterial things alike, not only in physics and chemistry and biology but also in economics, ethics, psychology, and sociology as well. Perhaps no law of nature is more general than the generalized Principle of Le Chatelier. Recent advances in the sciences support this statement.

If we attempt to produce a change in a system which is in real or pseudo-equilibrium, the system spontaneously alters in some manner different from the manner in which we are attempting to change it and in a manner to reduce the change we are attempting to produce. Putting the



NEW GAS TUBE FOR GENERAL ILLUMINATION DEVELOPED BY CLAUDE NEON LIGHTS, INC., TO OPERATE ON LOW VOLTAGES. IF LONGEVITY HAS BEEN OBTAINED IN THIS LAMP, IT IS A NOTABLE DEVELOPMENT

same thing in another way: if we have a *status quo* — a man, or a group of people, or a snowball, or a system of banking, or a mixture of chemicals in a flask — and attempt to alter it, the *status quo* spontaneously alters in a manner to counteract our attempt. The law appears to be universal. It may be called the Law of the Persistence of the *Status Quo*.

If we compress a gas, it warms up and becomes more difficult to compress than the cooler one would be. If we expand a gas, it cools down and doesn't expand as much as it would if it were warmer.

If we have a mixture of chemicals in equilibrium and attempt to increase the concentration of one of the components by adding a quantity of it, a reaction occurs, the equilibrium shifts, and the increase in the concentration of the substance which we have added is not as great as the amount which was actually put in. This special case of the general principle is called the Law of Mass Action.

A high pressure synthesis, such as that employed in making ammonia from hydrogen and nitrogen, is an interesting example. If we attempt to increase the concentration of the hydrogen and nitrogen by compressing the mixture, the gases combine to form ammonia and the concentration does not increase as much as it otherwise would.

If we attempt to compress ice, it melts. The water occupies less volume than the ice, and it resists our efforts to compress it further. If we release the pressure, the water freezes again. This is the *modus operandi* of making snowballs.

If we overstock the market with some commodity, the price drops and the commodity disappears from the market faster than it did before.

If people living on the products of their own agriculture have a high birth rate and tend to increase in number, they tend to specialize on the most convenient and



NEW A. O. SMITH CORPORATION RESEARCH AND ENGINEERING BUILDING. IT WILL HOUSE 1,000 ENGINEERS AND SCIENTISTS AND REPRESENTS MANY INNOVATIONS IN STRUCTURAL DESIGN



LAYING PRE-CAST ROADWAY SLABS ON THE WABASH AVENUE BRIDGE, CHICAGO  
Courtesy Inertol Company

onomical crop, and develop dietary diseases which again reduce the rate of increase of the population. This has happened in the Orient.

As to money: "easy come, easy go" is a well-known truth of human experience, and the bank account does not increase as fast as the income.

In ethics, ignorance is not virtue, innocence is not goodness. One must know evil to be wholly good, but all is not gain, for some of the evil sticks. Our efforts to be really good defeat their own purpose to some extent.

So it goes. There is hardly a situation to be found, if we describe it from the proper point of view, which does not illustrate the law of the persistence of the *status quo*. It is the law of the constancy of the form of nature, or the law of the flexibility of nature, according to our way of looking at it. If we make persistent efforts to alter a situation, nature has a way of wriggling out from under our efforts and the way she chooses is a way we have to discover by experiment.

### Food Facts

**B**ATTLES of the food technologist to make foods available throughout the year in their original state of freshness and flavor continue with marked success. We list below with acknowledgments to our contemporary, *Food Industry*, some of the recent accomplishments in preparing and preserving perishable foods.

1. The marketing of tomato juice in glass and tin containers.

2. Whole grain corn, in brine or packed dry in vacuum cans, is now in a stage of advanced commercial development. This corn is said to possess its natural flavor.

3. Irish potatoes are now being canned in Florida.

4. Other pending developments in canning include quicker methods of sterilizing, and the use of transparent or window type containers. Another trend is the increasing use of interior enamelled cans for both fruits and vegetables.

5. Fruit juices, frozen to preserve their natural flavor, indicate a trend away from the old-style imitation-flavor carbonated drinks. Another step from which much is expected is the Heyman process from which sterile carbonated beverages are produced by pasteurizing before carbonating. By this process concentrated syrups are

heated to pasteurizing temperatures, then placed in sterile bottles and filled with sterile boiling hot water under pressure. Still under pressure, the neck space of the bottles is filled with carbon dioxide gas, and the bottle crowned.

6. A new process for preparing chocolate milk includes the addition of a hot liquid concentrate made from a mixture of powdered milk and cocoa powder with sugar placed in sterile bottles and filled with water at 260° F. for final sterilization.

7. Fruit juices are being prepared by evaporation in a vacuum at a very low temperature. The result is a thick liquid which is then mixed with granulated sugar and dried. Electrical pasteurization of beverages is being tested.

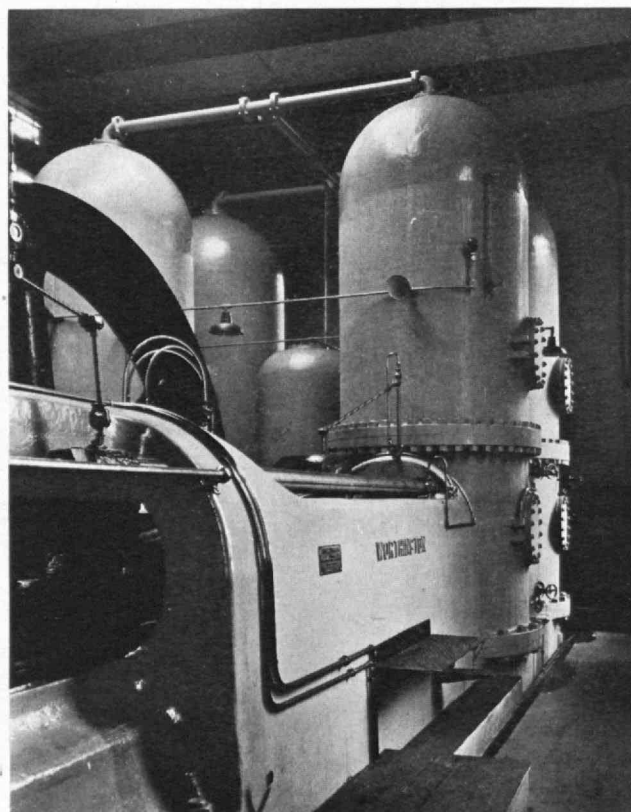
8. New machinery has been designed for the dairy industry, and canned cream of 18% and 36% butter fat content appeared on the market for the first time.

9. One large dairy firm is carrying on intensive dairy research to find a satisfactory method of producing milk containing desirable quantities of vitamin D as drawn from the cow.

10. In the preservation of foods, the most impressive advance in the past year was the development of methods of quick freezing, which holds high promise for the future. In preventing spoilage of fruits, ethylene is being widely used for ripening citrus fruits and for blanching of celery and other products.

11. Fungus or mould control, once considered impractical, is now recognized as necessary.

12. In the manufacture of sugar, experiments are being made on the storage of beet sugar in silos rather than in bags. On the Pacific Coast tests are being made



NEW PUMPING ENGINE AT THE FRESH POND PUMPING STATION, CAMBRIDGE, MASS.  
Davis

involving two important steps in sugar refining. These are the use of a vacuum filter instead of a centrifugal massecuite, and the development of a process of boiling sugar to grain automatically.

### Battling the Bookworm

**I**NSECTS are no respecters of rare books. Urged by hunger, they do not hesitate to feed on the most precious material. Constant vigilance is necessary to prevent their ravages. Imagine the consternation of the Huntington Library (California) authorities when some time ago they discovered that some of their great treasures were being attacked by these pests.

As a preliminary to a campaign against predatory insects, it is desirable to identify the species and to study its life history. It must be remembered that what the layman calls "bookworms" are usually not worms at all, but beetles (sometimes they are humans!); and that the damage to the books is done when the insect is in the larval stage. When the insects were first discovered in the Huntington Library, the services of a trained entomologist were enlisted to identify the insect enemy and he soon found its name to be *sitrodopa panicea*. This beetle lays its eggs in the interior of a book; when the eggs hatch into the larva, these begin to feed on the paper of the book, finally emerging as beetles.

Knowing this life history, the next thing was to devise a method of killing the egg and larva. And at this stage the services of a chemist, a professor in the California Institute of Technology, were enlisted. The ordinary, well-known method of killing insects with surety is by the use of hydrocyanic acid gas. But in this particular



BRIDGE ON THE DANUBE AT CERNAVODA, DESIGNED BY BELGIAN ENGINEERS

instance, this virulent poison was out of the question, for if it were used to fumigate the books, the gas would seriously injure the gold lettering on the fine bindings. After months of experimentation, the chemist devised a gaseous mixture made from liquid carbon dioxide and liquid ethylene oxide, which had the desired properties as an insecticide, but was neither inflammable nor in any way injurious to the books.

A new difficulty, however, confronted the investigators. It was found that the eggs of the beetle were enveloped in a very thin gas-proof membrane, which protected them against the poisonous gas. It was useless to attempt to kill the larva if the eggs were left to develop other larvae. This seemed at first to be an insoluble difficulty. However, a third research worker, a physicist probably, found that if the eggs were submitted to the action of a high vacuum, the air within the egg, by its expansion, ruptured the protecting membrane and thus exposed the egg to the action of the mixed gases.

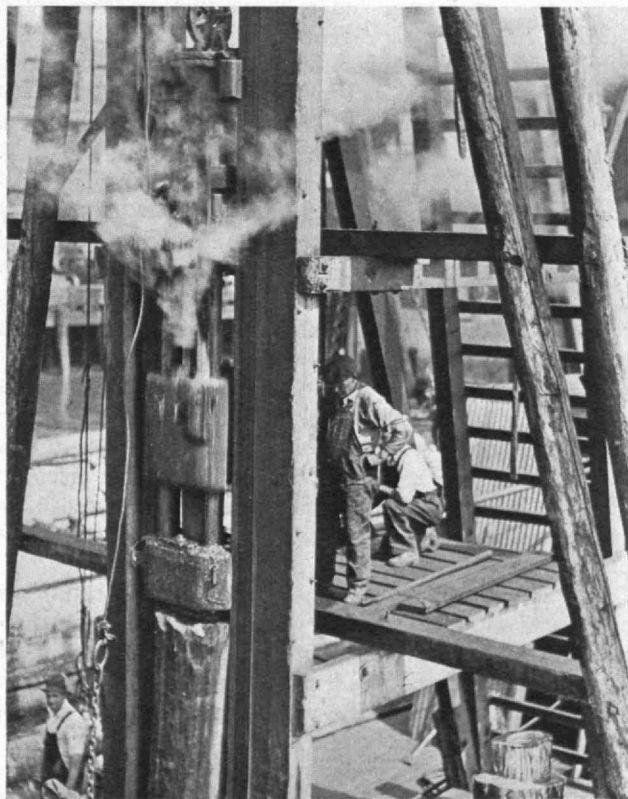
It only remained for a fourth research man, this time a mechanical engineer, to devise the appropriate apparatus to apply both vacuum and compressed gas to the affected books and manuscripts. This took the shape of a large tank or fumigator of half-inch metal, fitted with openings for introducing the material to be treated, and also having connection with a mixing chamber in which the lethal gaseous mixture could be prepared.

The books and manuscripts, placed on library trucks, are wheeled into the fumigator, the air exhausted to crack the egg-membrane, and the gas for treatment introduced from the mixing chamber. Thus neither insect or egg can escape the double action.

Thus, through the combined efforts of four scientific men, the danger of the destruction of the most valuable private library has been averted. Future generations must thank these men, and the library authorities who had sufficient belief in the value of research to employ them to solve this very perplexing problem.

### The Age of Alloys

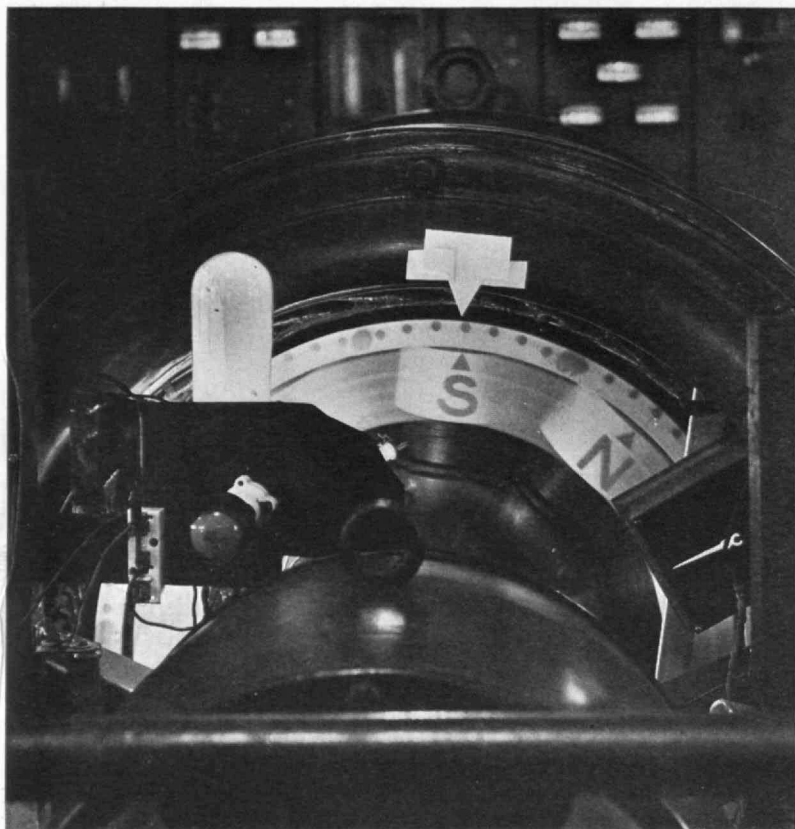
**H**ISTORIANS, prompted by a love for making facile classifications, have neatly divided history, giving their divisions such names as the Stone Age, Bronze Age, and the Steel Age. The latter, applying to modern



IMPACT! A PILE DRIVER IN ACTION

M. I. T. Photo





PHOTOGRAPH OF A MOTOR ROTOR TURNING AT A RATE CORRESPONDING TO A LINEAR SPEED OF 95 MILES PER HOUR. SUCH PHOTOGRAPHS ARE MADE POSSIBLE BY A NEW STROBOSCOPE ("WHIRLING WATCHER") DESIGNED BY HAROLD E. EDGERTON OF THE INSTITUTE'S DEPARTMENT OF ELECTRICAL ENGINEERING. IT MAKES POSSIBLE HIGHLY ACCURATE STUDIES OF THE ANGULAR DISPLACEMENT OF MOTORS AND GENERATORS DURING SWITCHING AND SHORT-CIRCUIT DISTURBANCES

M. I. T. Photo

times, is loose, and if we must have a category wherein to place ourselves, we might better name it the Metal Age, or perhaps yet more accurately, the Alloy Age.

So much has been written on the use of steel and the development of the modern nickel-steel alloys, that there is danger that we may overlook the application of other metals for a wide variety of uses. The place that copper alloys occupy in modern civilization is, for example, quite often not fully appreciated.

Brass and bronze are familiar alloys of copper, but modern metallurgy has produced a number of new ones which have remarkable properties. Brass, the most ancient alloy of copper, is a combination of that metal with zinc. The alloys of copper with the same amount of zinc are known as commercial bronze and red brass. This alloy is commonly used for window screening, the manufacture of cartridges, and for a great variety of ornamental articles. Red brass makes the highest grade of brass pipes, because of its great resistance to corrosion in water. In fact, red brass has a greater resistance to sea-water corrosion than copper itself.

The familiar yellow brass encountered in everyday experience is an alloy which varies in content from 75% copper, 25% zinc, to 63% copper and 37% zinc. Beyond that lie the brass alloys containing about 40% zinc, which can be hot rolled and forged, and are now used for a great variety of engineering purposes. Three of America's

cup defenders — the *Enterprise*, *Yankee*, and *Weetamoe* — were built with hulls of tobin bronze, an alloy of this type. The hull plating of these yachts each required approximately 55,000 pounds of tobin bronze, or 33,000 pounds of copper and 22,000 pounds of zinc.

Among the copper alloys now being produced are:

I. *Nickel Alloys*. Alloys of copper and nickel, because of new developments, are assuming great importance. The old name for such alloys was german silver. This alloy has been widely used in silver-plated tableware, and is now finding many new uses.

II. *Cupro Nickel*. In cupro nickel the alloy is produced by adding a small percentage of zinc to copper, which improves its resistance to corrosion, as well as the working properties of the alloy. The zinc acts as a deoxidizing and desulphurizing agent, increasing the resistance to corrosion and the malleability and density of the alloy. These copper-nickel alloys are being used extensively for architectural work, both interior and exterior. During the World War, the British Navy had a great deal of trouble with leaking condenser tubes. As a result, studies were made, and from them has been developed a so-called Super-Nickel condenser tube metal with a composition of 70% copper and 30% nickel. Alloys of this type are being used in many public buildings for plumbing fixtures, because the metal is white in color, easy to maintain, and is more durable than brass.

III. *Silicon Bronze*. Advances in electrometallurgy, which brought about production of silicon of high purity at a reasonable price, led to the development of silicon-copper alloys. During the World War, in the face of a shortage of tin, C. B. Jacobs, an engineer of the E. I. du Pont de Nemours and Company, started to make silicon-copper alloy parts to take the place of ordinary bronze for resisting chemical action. This alloy was found to be superior to tin bronze, and a range of compositions was patented. This metal has some of the characteristics of steel in strength and hardness, and has a high resistance to corrosion.

IV. *Tempaloy*. A new alloy known as tempaloy is copper hardened with nickel and silicon. The addition of aluminum strengthens it and considerably accentuates its hardening properties. Such material, on account of its physical properties and corrosion resistance, is excellent for shafts in speed boats and other high-powered vessels.

V. *Aluminum Bronze*. Although aluminum bronze is not a new alloy, it is finding increasing recognition, particularly in the development of aircraft. Copper-aluminum alloys are readily extruded, hot rolled, and forged. Such a bronze was used for the valve seats in the engine of the *Spirit of St. Louis*.

VI. *Beryllium*. As pointed out in the February Review, much is being heard now about beryllium, the metal of the beryl and the emerald. This metal is lighter than

aluminum and much harder. It readily alloys with copper, and is about five times as effective as tin.

VII. *Silver*. Attention is now being given to the study of alloys of copper and a small percent of silver. Research so far indicates that there are possibilities for alloys of this type.

Without discounting the great value of steel, it is a fact, nevertheless, that without copper steel could not be employed for many of its present uses. This is particularly true in machinery which would be useless without bearings and bushings of copper or copper alloys. The amount of copper used for this purpose last year was 48,000 tons, or 4.22% of the copper used in this country.

The uses to which copper is put are more varied than for any other metal, except iron or steel. Well-known forms are sheets, strips, rods, wire, tube, pipes, and many other shapes.

The metal is easily alloyed with others, although there are some metals with which it will not mix. The alloy of copper generally increases its strength, but decreases its conductivity for electricity and heat.

### *The Engineer as Artist*

ALTHOUGH the design and construction of almost every great engineering structure takes into consideration beauty of line and form, engineers are seldom given credit for an appreciation of art and its application in their profession.

Engineering knowledge alone never gave to a great bridge the beauty of sweeping arch, and a sense of balance in steel and stone, nor has the modern slender skyscraper been developed without a keen appreciation of beauty and good taste. In the application of art in his profession the designer and the builder face a task far more difficult than the artist who, working freely with color and line, may give full rein to his imagination. The engineer, however, combines beauty with utility. His bridges and his buildings, his great dams and power plants, his ships and locomotives must be designed and constructed to definite specifications of safety and usefulness. It is in his admirable balance of engineering knowledge and beauty that he manifests in his works the leaven of a fine imagination.

At the annual meeting of the American Society of Mechanical Engineers in New York early in December there was an exhibition of art in which the skill of hundreds of engineers in various branches of the profession was shown most impressively. Of the hundreds of paintings, etchings, drawings, and fine photographs submitted, it was possible to hang less than three hundred exhibits. And these, in choice of subject, conception, and skill in execution, were evidence of the artistic ability of hundreds of engineers who from time to time turn from the drafting board and building to work with pen, pencil, and brush in a hobby which must enrich their knowledge as engineers.

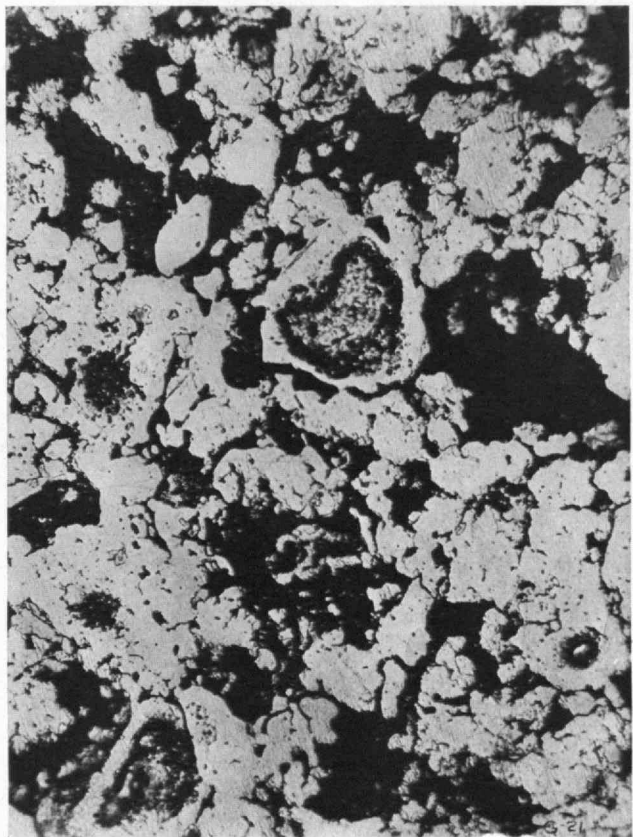
### *The High Price of Radium*

DEEP in the jungle of the Katanga district of the Belgian Congo in Africa is a small mine in which lies the world's richest store of radium. The Chinkolobwe

mine, controlled by the Union of Minierie du Haut Katanga, is a mysterious place, carefully guarded from intruders. It lies in the southeast corner of the Belgian Congo, just north of the Rhodesian border. To the east of it lies Lake Bangweulu. Beyond that, alone in the jungle not far from Lake Nyanza, stands the memorial to David Livingstone.

To this isolated spot Dr. Hayden Guest, a physician and a member of the British Parliament, recently went in search of information that might throw some light on the production and cost of radium. Dr. Guest represented the *Daily Herald* of London. It was his purpose to determine whether the price of radium, which in the United States is \$70,000 a gram, is justified. He went down to the crude little mine in Katanga because this "hole in the ground" controls the world's supply of this very rare mineral.

Soon after Pierre and Madame Curie discovered radium in 1898, the mineral could be bought for as low as \$2,500 a gram. In 1910 small quantities of radium were found in Bohemia, and four years later deposits of an ore in which the mineral is found were discovered in the United States. The yield from this source was sold in the United States for \$120,000 per gram, and from 200 to 400 tons of rock had to be crushed to yield that small amount. The American deposits were found in Colorado and Utah. Other sources are Australia, Portugal, and Czechoslovakia. The rich store of ore in the Congo was not discovered until 1915. The ore from which the radium is produced in this district is oxide of uranium, and



SECTION OF A NEW SELF-OILING BEARING METAL, OILITE, MAGNIFIED 500 TIMES. ITS POROUS NATURE IS APPARENT, DARK AREAS REPRESENTING OIL

Chrysler Corporation

it is said that the yield is a gram for every ten tons of ore, by far the richest so far discovered.

The mysterious Chinkolobwe mine is surrounded by barbed wire entanglements, and visitors are barred from it. Nevertheless, Dr. Guest with his wife drove directly to the mine. He found there an open quarry from which galleries penetrated into the earth. The ore was hauled up from the bottom of the quarry on a cable tramway. The mine, he wrote, appeared to be operated with great economy. He was refused admittance to the workings, and could gain no information from the officials at the mine. In the short time that he was allowed to remain there he saw natives sorting great lumps of yellow and gray-brown ores rich in radium. Their only tools were sieves and large shovels. The cost of labor, he thought, could not be more than \$5 a week per man. He estimated that the cost of raising the ore to the surface was approximately 75 cents a ton, and transportation to the nearest railroad less than \$1 a ton. The ore is shipped thence to the west coast.

Supposing the cost of mining to be \$250 per ton, it would be small in proportion to the price of the radium yield, Dr. Guest believes. He questions whether the subsequent cost of crushing and crystallization processes amount to as much as \$2,500 a ton. Even that cost would leave a tremendous profit. During 1929 this mine is reported to have produced 60 grams of radium, which at present American prices would have a value of more than \$4,000,000. Dr. Guest learned that radium has been produced in Great Britain from imported ores of inferior radium content at a cost yielding a profit if sold as low as \$25,000 a gram.

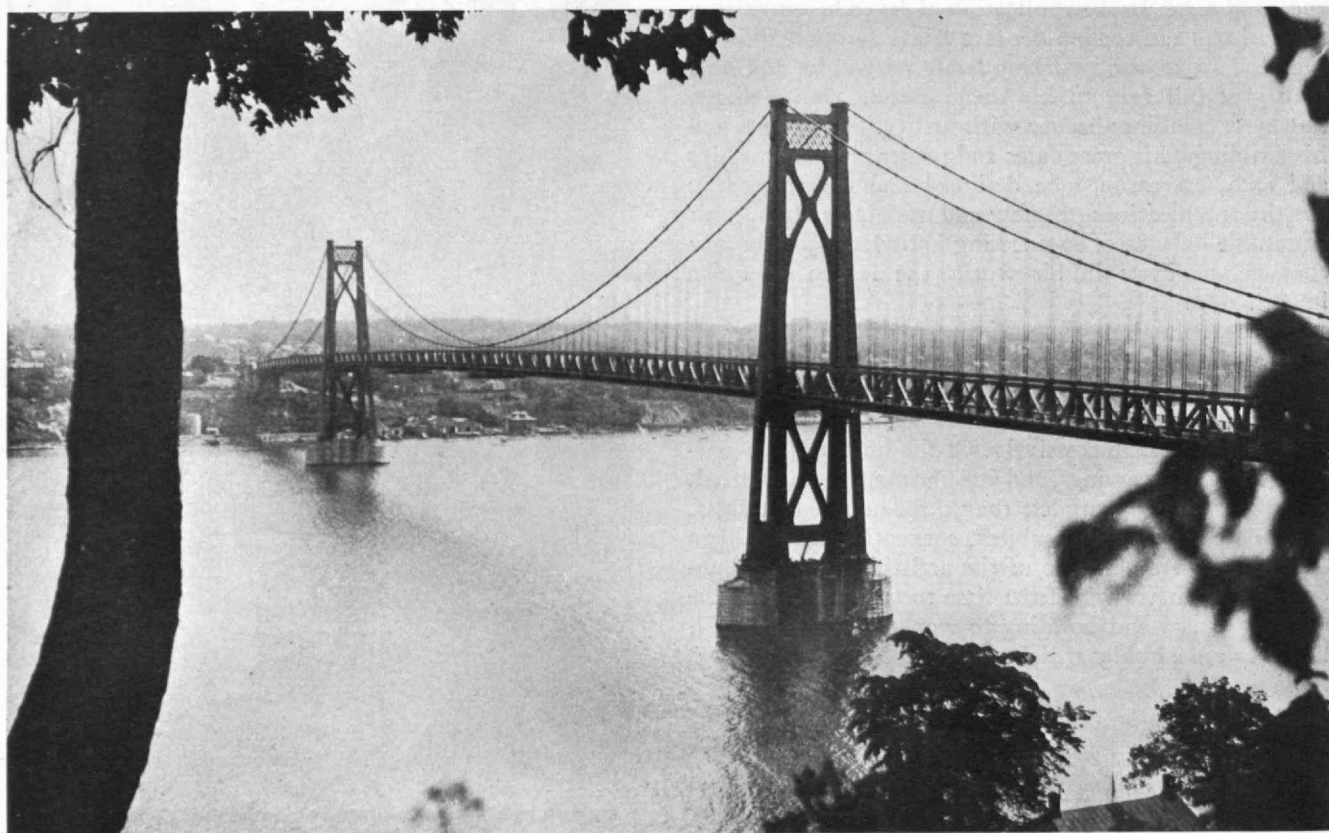
The methods of extracting radium vary, but the outline of the process worked out by Madame Curie consists of five steps. These include getting the uranium mineral in solution, separating from the solution all metallic sulphates which are insoluble in water (these include the whole of the barium and radium constituents of the mineral). The next step is the conversion of the sulphates into double salts, purification of the compound of radium and barium, and finally separating the radium from the barium by a process of fractional crystallization.

As a result of his investigation, Dr. Guest thinks that because of the great value of radium in the treatment of disease, particularly cancer, the world might well demand publication of the costs of producing the mineral.

### *"Magnificent Creators of Unemployment"*

AS IF in answer to Stuart Chase's appeal in the November Review for an awakened consciousness in the *engineering mind*, we read that the executive imagination of this "most important group in the modern world" has been aroused to a realization of its professional responsibility and is planning a study of the underlying causes of technological unemployment. The psychological implications of unemployment in its relation to society are fully discussed in the article by Mr. Bakeless, "Machine-Made Minds" (page 275).

It is interesting to notice that engineers as a class have now publicly announced their determination to study the situation as indicated by a report of the American Engineering Council, representing 59,000 professional engineers in all parts of the (*Continued on page 308*)



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### Scientific Book Club Selections

**B***Y special arrangement with the Scientific Book Club, Inc., The Review is to present each month a list of books selected by that body as meriting the careful attention of all who desire to keep abreast of scientific thought. The selections are made by an editorial committee consisting of Arthur H. Compton, Edwin G. Conklin, Kirtley F. Mather, Harlan T. Stetson, and Edward L. Thorndike.*

*For February the principal selection was:*

THE SCIENCE OF LIFE, by H. G. Wells, Julian Huxley and G. P. Wells. \$10.00. 1,514 pages. Illustrated. New York: The Scientific Book Club, Inc.

"'The Science of Life' is conceived in the broadest possible sense. The book embraces not only the entire field of biology, but also of historical geology, the physiology of man, animals and plants, human and animal psychology, the philosophy of evolution and even makes a brief excursion into the realm of spiritualism. . . . It may be said that the book begins and ends with man, and that all that lies between is 'humanized knowledge.' Its sweep and scope are so great that principles and details appear in their proper proportions."

*Other highly recommended books obtainable from the S. B. C. are:*  
ZEPPELIN, by Margaret Goldsmith. \$3.50. 278 pages. Illustrated.

AVIATION OF TODAY, by J. L. Nayler and E. Ower. \$6.00. 491 pages. Illustrated.

THE NATURE OF LIVING MATTER, by Lancelot Hogben. \$5.00. 316 pages.

HUMAN LEARNING, by Edward L. Thorndike. \$2.50. 202 pages. Illustrated.

### Government in a Technological Society

THE AMERICAN LEVIATHAN, by Charles A. Beard and William Beard. \$5.00. vii + 824 pages. Illustrated. New York: The Macmillan Company.

**I**N AN article, "Machine Age Politics," in the January Review, the Beards by example and inference demonstrated that the social environment of government has been revolutionized by steam, electricity, machinery, and science. Not only has the environment been vastly changed, but the "technological revolution has thrust itself into all the institutions and practices of government. It has emphasized as never before the rôle of government as a stabilizer of civilization." This article might well stand as a prolegomenon to "The American Leviathan" (even though the writing of the book preceded the writing of that article) for it constitutes an admirable preliminary statement for the book.

This technological drive in government, which is the central idea around which the Beards build their book, is too little realized in our political thinking, granting that such thinking exists in America. The rank and file of the American people still conceive of their govern-

ment, founded in an agricultural era, in the light of that era. A majority of the politicians, busy with their pastoral politics, and lulled by their bucolic musings, view the scene about them with the naked eye of the Eighteenth Century, oblivious to the fact that they can only see it correctly by using the fine instruments of the Twentieth Century.

While they muse, however, government under the pressure of forces originating in the laboratory and in the minds of technicians, has become an economic and technical business on a tremendous scale. "Fortunately in introducing these bewildering complexities into government," write the Beards, "technology has brought with it a procedure helpful in solving the problems it has created; namely, scientific method. . . . Though undoubtedly limited in its application, the scientific method promises to work a revolution in politics, no less significant than that wrought in society at large by mechanics. It punctures classical oratory — conservative as well as radical — and offers to explore worlds unknown to politicians of the archaic school. Recognizing the demands of a new order, a United States Senator, Elmer Thomas of Oklahoma, has proposed an official reëxamination of our whole traditional system of government in the light of the changed situation."

It follows that the scientist-engineer is called upon to play an increasingly important part in this new political situation. That he has not done more is the result of his willingness to play the part of the hired man — he is Prometheus enchained as Mr. Stuart Chase expressed it in a recent article in this magazine. If the scientist-engineer is to make his due contribution to the efficiency of our governmental machinery, he must recognize his importance in the new order of things and insist that the government utilize the competence and expertness that is necessary to cope with the complexities of the Machine Age.

All of these things are thrown into bold relief in this new book on American government. It reviews in detail every aspect of our political economy and illuminates the many dark and dubious corners of the political structure. And it is done with the trained, scholarly, competent manner that has characterized the previous books from the pens of the Beard family. Not quite as stirringly written, perhaps, as the "Rise of American Civilization," it is presented in a manner appropriate to the subject. Engineers and scientists, no less than other folk, will find it valuable for reference, stimulating to read, and worthy of study.

It is interesting to note that the bibliographical note at the end of the book contains not only references to a host of books, pamphlets, and articles, but a list six pages long of educational films which throw light on the functions of government. So far as I know this is the first time that motion picture films have been organized with reference to a particular study and have been consulted in making that study.

J. R. K.



## *The New Life Members*

**L**AST month The Review announced the election of Messrs. John R. Macomber, '97, Albert H. Wiggin, and Alfred L. Loomis as Life Members of the Corporation. All three of these men have won high places in the business world (Mr. Loomis in the legal profession, also) and are well known in their respective fields. But what of their extra-curricular activities, so to speak? For the purpose of answering this question the following sketches have been prepared:

JOHN R. MACOMBER, '97

Mr. Macomber is a man of strong enthusiasm, great energy, and simple tastes. He is active in a wide variety of interests and is noted for his quick and decisive judgment of men and affairs. His name, long familiar in the world of business and finance, is equally distinguished wherever sportsmen gather. Like many other successful men, he has found relaxation in a hobby, and for years much of his leisure has been devoted to the breeding of thoroughbred horses.

Raceland, Mr. Macomber's private stables on his estate at Framingham, Mass., is one of the most complete and beautiful racing establishments of its kind. He has imported many horses from abroad, and from his stables have come many thoroughbreds that have distinguished themselves in racing. Mr. Macomber's interest, however, is not confined to racing alone, for he has given much of his time and means to the restoration and maintenance of those fine amateur sports in which horses play a part. He has been particularly active in a revival of country club racing and in horse shows, and is a celebrated host among American amateur sportsmen.

Of Mr. Macomber's many famous race horses, Petee Wrack, son of the famous Wrack, and handicap mile champion of America, is perhaps the most distinguished. He holds the distinction of being the only horse to defeat the brilliant Reigh Count, winning this victory in the Travers Midsummer Derby at Saratoga last year.

As Chairman of the Board of Directors and earlier President of Harris, Forbes & Company, Mr. Macomber is nationally known as a financier whose achievements have been born of long training and sound judgment. He began his career with the same company in 1894, and in 1916 became its president, a position he occupied until his election as Chairman of the Board of Directors a few months ago. He is a director in numerous corporations, including the Chase National Bank of New York; the First National Corporation and Harris Trust and Savings Bank, Chicago; Harris Forbes and Company, Ltd., Montreal; and he is a trustee of the Warren Institution for Savings, Bankers Investment Trust, Federal Street Building Trust, Massachusetts General Hospital, the New England Conservatory of Music, and the Society for Prevention of Cruelty to Animals, Boston.

When in 1921 Mr. Macomber was awarded the honorary degree of Master of Arts, the President of Tufts College, in conferring the honor said: "The tradition that business men and college men labor in separate fields happily is passing away. More and more, business is recognized as a profession. More and more the problem of education becomes a universal one. In recognition of the high standard of business ethics you have maintained as head of one of the largest and most representative financial houses in our city, in appreciation of what you have done as a member of the Chamber of Commerce of Boston, and in gratitude for the splendid work you did in the New England Liberty Loan Committee, I confer this degree."

ALBERT H. WIGGIN

The Chase National Bank is the largest bank in the world, and Mr. Wiggin is chairman of its governing board. That is the most widely known fact about this new Life Member of the Institute's Corporation, with the possible exception that he is a leading American man of business who favors a reduction in inter-Allied debts. The latter fact was revealed in Mr. Wiggin's annual message to his bank's stockholders in January. Noted for being taciturn and not given to public proclamations, he speaks to the public only in his annual reports, making them events in the business calendar.

His 1930 annual report presents a survey of the present unfavorable conditions with the assertion that "we are approximately at the worst of depression" and that the next important move will be upward. Other suggestions of this important report are a modification of the tariff and a reduction in the capital gains tax from 12½ to 7½ per cent. As a leader in Wall Street, Mr. Wiggin is credited with directing a large portion of the banking effort to relieve financial stress.

His interests, however, extend beyond the world of banking, as his appointment to the Corporation indicates (he is also a trustee of Middlebury College). He has been called "the banker with a million friends," the newspaper reader who can "read all the morning papers in New York in no time at all. (And does.)" One of the distinguishing characteristics of this successful financier is his inscrutable expression, one that lends confidence to people with whom he has dealings, and one that has many times stood him in good stead. His well founded belief in himself has carried him safely over his misfortunes and led him to larger opportunities for displaying his talents.

Outside of his professional life, Mr. Wiggin considers his circle of friends of the utmost importance. In a magazine interview he expressed his personal opinion of the natural source of friendships. "Friends don't make a man, but if a man has the right qualities, the right caliber, he cannot help making friends; they just feel drawn to him." In order to gain his reputation of "the banker with a million friends," he must have possessed such qualities to a remarkable degree.

He is the son of a Massachusetts clergyman, is married, has two daughters, and homes in New York, Greenwich, Conn., and South Carolina. He is a collector of etchings and is fond of golf. He graduated from the English High School, Boston, in 1885, but did not go to college. During the war he was United States Fuel Administrator for the State of New York.

#### ALFRED L. LOOMIS

Mr. Loomis, a lawyer by profession, has probably the finest and most interesting private laboratory in this country. His own researches have dealt principally with physical, chemical, and biological effects of supersonic vibrations, with the development of ingenious timing and control circuits using modern radio and glow tubes, and with the accurate measurement of time. During the past two years he has kept a continuous automatic record of the time signals from Greenwich, the Eiffel Tower, and Annapolis, and checked them against the finest collections of pendulum clocks and chronographs which has ever been assembled. An additional check has been given by continuous records from the vacuum quartz oscillator of the Bell Research Laboratories in New York.

One of the interesting papers at the recent meetings of the American Association for the Advancement of Science, in Cleveland, was by Yale astronomers, and based on Mr. Loomis' experiments on the measurement of time. Peculiar cyclic anomalies in these time records are accounted for, at least in part, by a hitherto unsuspected action of the moon on pendulum clocks and on the figure of the earth, since the experiments are accurate enough to detect a distortion of the earth which changes by only a few inches the distance from the surface to the center.

Mr. Loomis has been very generous in inviting other scientists to share the facilities of his laboratories as his guests, and from time to time has arranged delightful week-end conferences in honor of distinguished foreign scientists, at which a hundred or so prominent scientists from all over the country have been his guests.

Last summer Mr. Loomis conducted an interesting experiment in the education of young men, designed to give promising boys, whose experience had been limited, an opportunity to learn about the nature and possibilities of careers in various fields. He designed some special touring cars, accommodating ten boys each, with complete sleeping, cooking, and transportation equipment. Each of these groups, under the direction of one of its number, made a tour of the leading industrial plants of the East and Middle West. This tour proved very successful and was carried out at a remarkably low cost per boy.

Mr. Loomis has been much interested in the affairs of the American Physical Society and particularly in its program for publication of research. He is also much interested in sports, having been associated, for example,

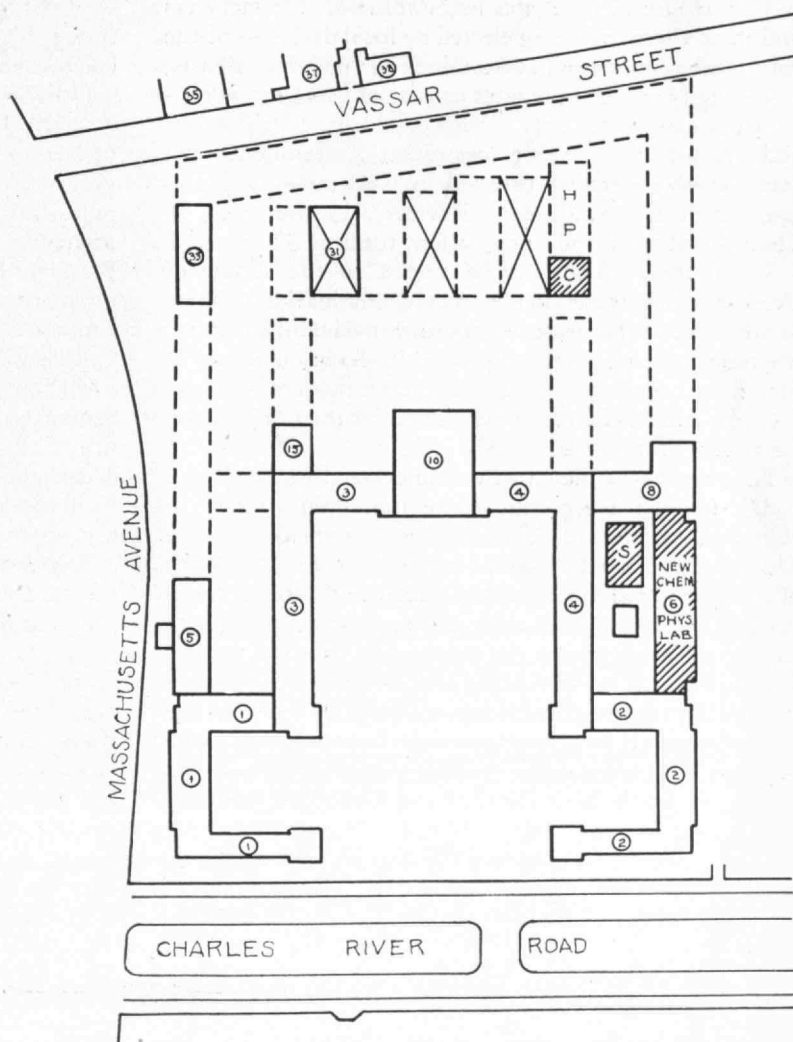
with his brother-in-law, Mr. Langdon Thorne, with the *Whirlwind*, one of the five contenders in last summer's yachting races.

Because of his combined qualifications of lawyer, business man, and scientist, Technology has particular cause to welcome him as a member of the Corporation.

#### The 149th Meeting of the Alumni Council

THE major portion of the Alumni Council meeting in Walker Memorial on January 19, was devoted to a discussion of the report of the Committee on the Reorganization of the Alumni Association. This committee, composed of Charles W. Aiken, '91, (*in absentia*), Francis J. Chesterman, '05, Bradley Dewey, '09, Francis E. Stern, '16, and Allan W. Rowe, '01, had made a thorough study of the problems facing the Alumni Association, particularly that of nominating the Term Members of the Corporation.

"Since its organization," says the Committee's report, "the Alumni Council has elected a Nominating Committee whose function yearly has been to present a slate for the officers of the Alumni Association and a group of



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candidates for Term Membership on the Corporation. Originally, these names were then sent to the Alumni Association in the form of a ballot. Voting on the officers was a perfunctory exercise as no choice of candidates was offered; initially six candidates were offered for Term Membership, of which the three with highest vote received the Corporation nomination. Experience demonstrated in the course of years that a number of defeated candidates were alienated from the Institute. To correct this condition, a number of years ago, the number of candidates for these positions was increased to nine on the pleasing theory that the individual share of the odium of defeat would be lessened thereby. This did not prove to be the case and a situation increasingly acute was thereby engendered. The number of Alumni voting on these matters has shown a steady decline in recent years, most recently less than 20% exercising the right of suffrage."

The new plan submitted to the Council by the Committee is designed to correct these undesirable conditions. In brief abstract the plan suggests that:

1. The present Alumni Council be dissolved;
2. A Boston Technology Club with a local Council to handle local affairs be organized;
3. A House of Delegates be established, the members and their alternates being elected by local divisions of the total Technology group, determined on a population basis;
4. The House of Delegates consist of (*with vote*) President (in case of tie only), Vice-President, 15 delegates, and five past Presidents (most recent), totaling 22; and (*without vote*) Secretary (elected by Corporation), Treasurer (from The Technology Review), 15 alternates, 15 Term Members of the Corporation, totaling 32.
5. All major functions be vested in the House of Delegates such as election of officers, nomination of Term Members to Corporation, nomination of Alumni Secretary, amendments to Constitution and By-Laws, election of Standing Committees, and similar major items of business;
6. An Alumni Secretary be elected by the Corporation for a term of five years.

The report was presented to the Council by Dr. Rowe and it elicited a vigorous discussion. Points raised in objection included: (1) That the classes, the most reliable Alumni units, would have no representation. (2) Doubt as to the possibility of getting delegates to attend meetings. (3) Disagreement with the geographic groupings tentatively suggested in the report. (4) That the present Alumni Council is functioning properly and will be more efficient than the proposed House of Delegates. (5) That the present system is functioning so well that no change seems necessary. These and other minor objections were raised to which Dr. Rowe made detailed and admirable rebuttal.

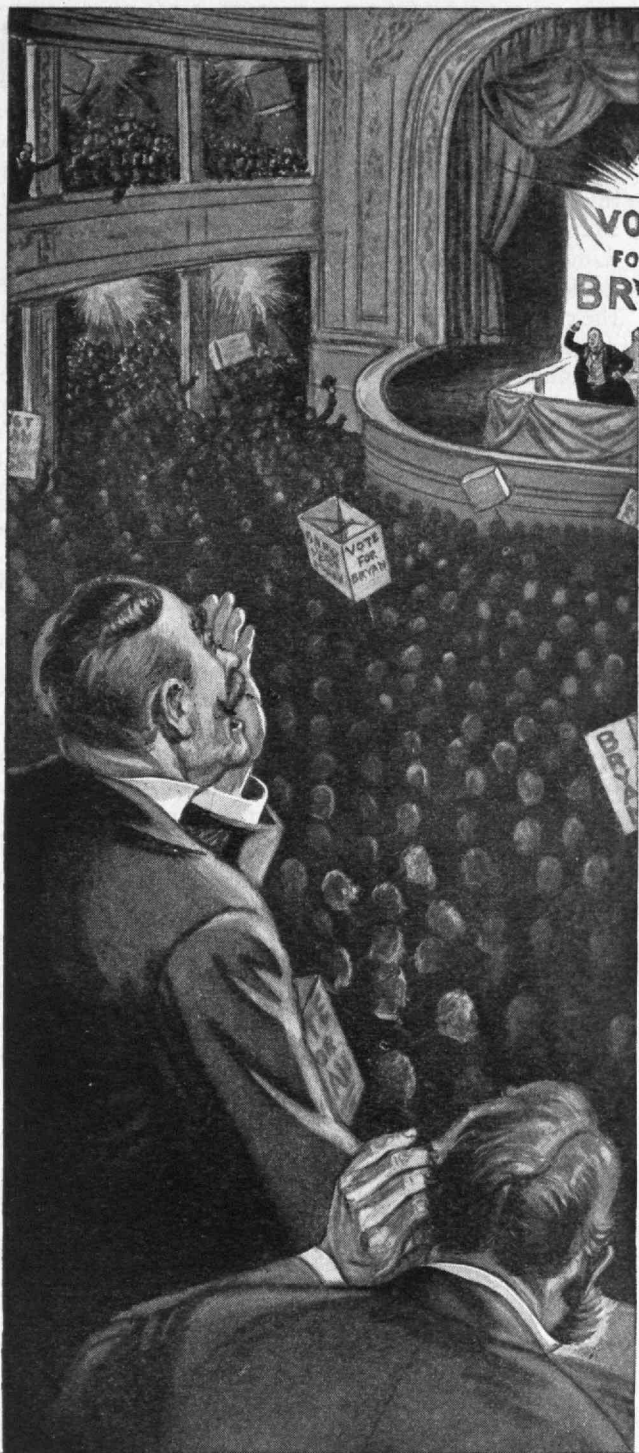
The offshoot of the discussion, which was one of the longest in the history of the Council, was a vote that the Reorganization Committee be highly commended for its work and that the report be carried over for further discussion and possible final action at the March meeting of the Council. During the discussion letters were read from the St. Louis and Louisville Clubs, and other representatives who had communicated with their groups presented their opinions.

Next to the discussion of the reorganization report, the most notable item on the program was the report of the committee appointed to determine the official M. I. T. colors. This committee was appointed in 1926 and its report had been eagerly waited for several years. The members, Samuel P. Mulliken, '87, (Chairman), Allan W. Rowe, '01, Charles Bittinger, '01, and Arthur C. Hardy, '18, made a thorough study and the report which incorporates their findings is a first-rate scientific document. The exact shades of cardinal and gray were scientifically determined and a formula developed by which these colors can be reproduced in the future without variation in shade. This is believed to be the first time that an educational institution has made its official colors the subject of scientific research. The Review expects to publish in a future issue an extensive article on the work of this committee.

Other items on the Council program included a talk by Richard H. Ranger, '11, President of the Technology Club of New York, on the Alumni Seminars initiated by his group. Two new Council members, Henry D. Jackson, representing the Class of '05 and John A. Lunn, '17, representing the New Haven group, were announced. President Desmond outlined plans for the Annual Dinner on February 28 and Professor Leicester F. Hamilton, '14, explained the details of the Annual Dormitory party on February 13, to which members of the Alumni Council and their lady friends were invited to attend. Professor Samuel C. Prescott, '94, presented his report on the recognition of contributors to the Dormitory Fund Campaign. This report in its complete form, he announces, is not to be made public until after the February meeting of the Council.

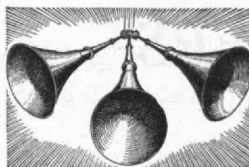
President Compton was present and spoke briefly at the end of the meeting. He called attention to two notable pieces of work now going on at the Institute; one educational, in the form of a study by the Committee with Professor Prescott as Chairman, to improve and simplify the second year curriculum; and the other physical, involving a downward movement in the excavation for the new physics and chemistry building. Sixty-eight members and guests were present at the meeting.





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## MACHINE-MADE MINDS

(Continued from page 278)

of machine society, a competition due to the over-production caused by our failure to control the machine.

It is time to strike a balance, and granting that our minds are in large measure undeniably machine-made, to ask ourselves how far the machine's control over us is a danger calling for vigorous resistance; and how far it is a good thing, to which we may willingly yield. No doubt the chief danger the machine brings with it is the heavily disguised blessing of mass production. An admirable technique for the creation of motor cars, tractors, and safety pins, this is somewhat less desirable in the realms of imagination and ideas. Mass production, nevertheless, intimately affects these realms through the huge advertising campaigns needed to make mass markets for mass producers, which have naturally created the mass magazine with a circulation of one or two million.

The whole mass system militates against vigorous and provocative thought and against vitality or intellectual honesty in letters. The mass magazines dare not offend mass prejudices. The contemporary writer, therefore, is held down to the taste, not of the lowest element of the population, which has no purchasing power, but to the level of prosperous mediocrity. That may not be a dead level, but it is certainly not a very live one.

The same thing is true of books, especially now that we have the one dollar "drug store book." It is glaringly true in the movies and talkies, where a producer knowing that he must spend four million dollars on a film is forced to keep to a level of taste which four million people can share. It applies to radio, which seeks about the same audience as the mass magazine. It scarcely applies to the phonograph, which is slowly doing for American musical taste what mechanical reproduction of paintings may yet do for art.

THE danger is that our minds may be tied down to the machine. Our art may some day be restricted (as advertising art has always been) to that capable of mechanical reproduction, our music to the requirements of radio, talkie, and phonograph (sopranos have a bad time in the talkies, hence, the future may listen to altos only), and our philosophy watered down to satisfy the enormous audience of Mr. Will Durant. All because we have misused the machine, or allowed it to misuse us.

There are even contemporary biologists who tell us that the ordinary processes of embryology will one day be superseded, and that babies will one day be mechanically produced in glass bottles in a state laboratory! This is not very sound biology (to put it mildly) nor even very scientific speculation (if any speculation is ever scientific); but it shows at least the direction in which the modern mind is working.

In creating the manifold perfections of the modern newspaper, the machine has very nearly destroyed the *raison d'être* of all decent journalism — the free expression of free opinion. Machines are so expensive that the machine-made press is necessarily controlled by a few very wealthy men, who with the very best intentions in the world are still subject to human limitation and the prejudices of their kind.

(Concluded on page 300)



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## MACHINE-MADE MINDS

(Concluded from page 298)

The day has gone by when anyone with five pounds and a printing press could state his views. The day is over, therefore, when it made sense to talk about a free press. The old newspapers were very much worse than the modern ones in most respects. But, at least, an unpopular truth had a chance of expression. Today the man or the government that controls two machines — wireless and cable — can control the ideas and passions of a continent. The hysteria of propaganda was well known to Peter the Hermit and Oliver Cromwell. But never in the reign of any despot was it so easily manipulated from a few central stations. Never did the propagandist escape so easily from checking and correction as he has since the Iron Despot settled firmly in his factory throne.

I BEGAN this article by saying that I had no intention of indulging in anti-mechanical Jeremiads, an assertion on whose veracity the last few paragraphs might cast a reasonable doubt. Still, we can hardly hope to use the machine as a liberator until we have frankly faced the fact that it may become a tyrant. Even as a despot, the machine is benevolent; and it is after all our stupidity that permits inanimate iron to be a despot at all.

It is fairly clear that the machine, however it has debased some arts, has given new life to others. The first really new architectural idea for generations, the columnar skyscraper, is the direct outcome of machine tech-

nique. The moving picture has always hovered on the verge of becoming an art. Its failure is surely the result of human rather than mechanical limitations.

If the world ever realizes the hitherto Utopian vision of a general diffusion of the good things of life — an ample assurance of food, clothing, and shelter for everyone, to which is added leisure for art, letters, pure science, and philosophy, the gorgeous playthings of the mind — it will have to look for them to the machine. That is, it will have to look to the machine for the economic basis on which these things must inevitably rest.

The great cultural hope which the machine holds out is the possibility of increasing leisure. Just at present, unfortunately, it is creating unemployment, which is a very different thing. Nevertheless, mental life of any really high kind is a matter of leisure well used. And leisure, as Aristotle saw, can exist only if somebody does the dirty work — only, in other words, on a basis of slave labor. In his Greece, as in our own old South, leisure existed on a basis of chattel slavery. For the last century it has rested on a basis of wage slavery. We now see the hope (as yet it is little more) of a general leisure, based on the slavery of the machine.

Strangely enough, we have hitherto been willing to enslave ourselves to the machine instead of enslaving it. Most of our contemporary troubles arise from that odd willingness to allow the machine to be master instead of slave. If we are to build a great civilization in America, if we are to win leisure for cultivating the choice things of the mind and spirit, we must put the machine in its place.

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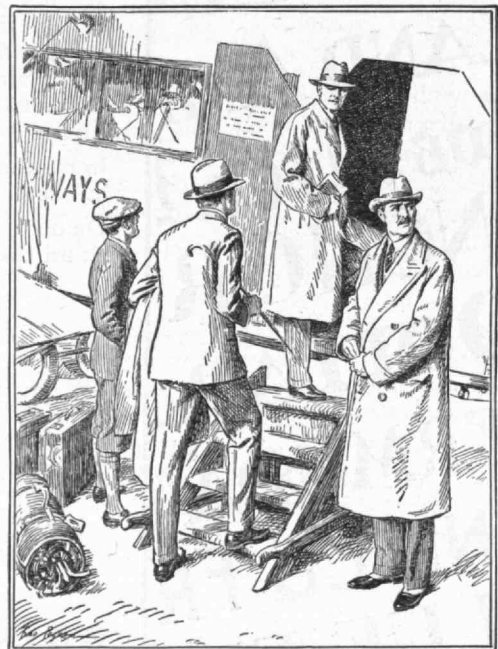
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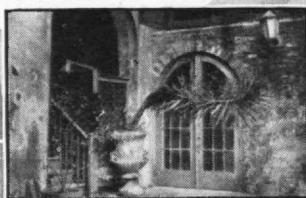
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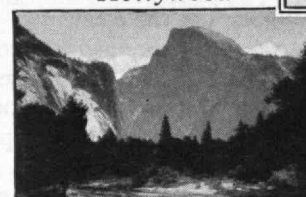
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## FIFTY PFENNIGS' WORTH

*(Continued from page 281)*

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In the department of optics are original instruments by Fraunhofer and Kirschhoff and demonstrations of the measurements of velocity and intensity of light, refraction, diffraction, and polarization with interesting demonstrations of mirrors, prisms, and lenses. Optics begins with a study of the eye and shows original instruments by Helmholtz (the telestereoscope, phakoscope, and ophthalmoscope). In another alcove are stereoscopes with diagrams showing the theory of colors and color contrast effects; microscopes, telescopes, with an original telescope by Fraunhofer with which the planet Neptune was first seen in 1846. A whole room is devoted to the development of projection apparatus and cameras, while adjacent rooms are devoted to telephotography, television, and acoustics.

One of the most beautiful rooms in the whole building is devoted to music with instruments ranging from the crude rattles and drums of savage tribes to the various wind, string and keyboard instruments; from the simple lyre of antiquity to the modern pipe organ and grand piano, both manual and mechanical. Skilled musicians give demonstrations on the various instruments daily to large and interested audiences.

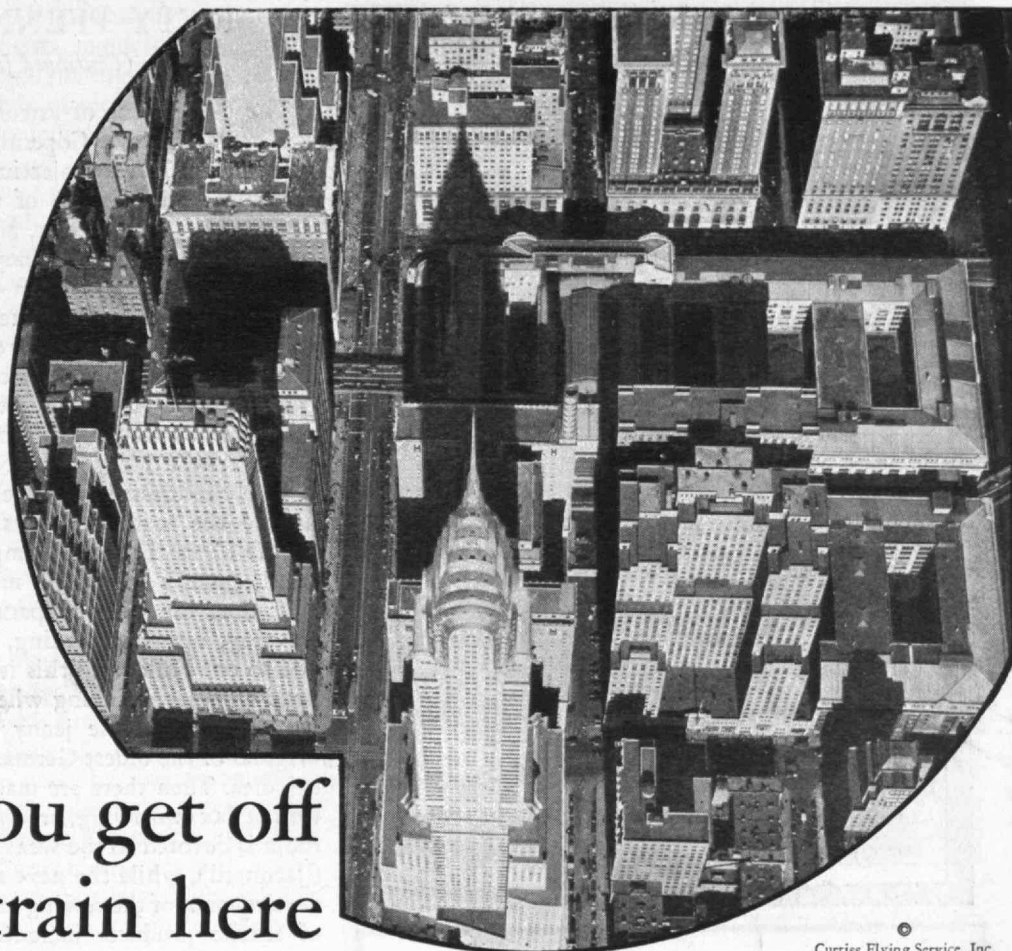
In the department of chemistry much space is given to early developments. A vaulted Gothic room shows an alchemist's laboratory of the Sixteenth Century. From this to the iatrochemical period with its herb garden and distilling-plant is but a step, and beyond that is displayed the apparatus used by Boyle and that used by Priestley, Cavendish, and Scheele, in the "phlogiston theory" period. There is a copy of Lavoisier's experiment of analyzing water, with reproductions of other apparatus by Lavoisier, Liebig, Berzelius, Wöhler, and Bunsen. The different cases showing modern chemistry demonstrate fundamental principles and modern chemical apparatus for analysis and synthesis, with demonstrations of reactions, spectrum analysis and so on. A large central case is devoted to a collection of the elements.

Inorganic chemistry shows the industrial production of nitrates, nitric acid, sulphuric acid, sodium carbonate, and so on, in ancient and modern times. It shows the development of electrical furnaces and a large replica of a Haber-Bosch plant producing ammonia sulphate. Organic chemistry shows products formerly secured from plants but now produced by synthesis, the relations between raw products and the finished products of industry and on a long wall a ten-foot high "family tree" of coal tar products.

An entire wing is devoted to building materials and buildings, starting with woods, their structure and employment; natural and artificial stones; ceramics and glass and their manufacture and use. The models of buildings start with the primitive caves and carry on through timber and masonry buildings, and even go into the fascinating field of town planning. It takes up the evolution of lighting from the pine torch to the latest developments in electricity. With these are graphical demonstrations of heating, refrigeration, water supplies, sewage, plumbing, gas, and electrical engineering.

*(Continued on page 304)*

Unusual air view of the vicinity of *The SHELTON*, the Grand Central District, showing Chrysler Bldg. in the foreground.



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## FIFTY PFENNIGS' WORTH

*(Continued from page 302)*

The department of astronomy contains planetaria of the Ptolemaic and Copernican systems. The Ptolemaic planetarium has a projecting apparatus with 119 lenses and throws the image of the star-sprinkled sky on a dome 30 feet in diameter, and also shows the movement of the heavenly bodies at any desired speed. The Copernican planetarium, in a room 40 feet in diameter, is a movable model of the solar system, in which the observer is carried in a cage in a path representing the earth's orbit. There are many astronomical instruments including an original 15" Fraunhofer telescope and a 400 M. M. reflecting telescope by Goerz.

The textile industry of New England would be particularly interested in the next eight rooms, in which are housed the textile exhibits, showing first the various textile fibres like flax, hemp, jute, china-grass, cotton, wool, camel's hair, silk, metal filaments, and artificial silk; then the work preparatory to spinning, including cleaning, opening, carding, combing, drawing, roving, and so on. Following this is a collection of machines — hand spindles, spinning wheels, spinning machines, and the Crompton mule jenny of 1775. Here we find the original of the oldest German spinning machine, with 60 spindles. Then there are machines showing the preparation of flax (throwing, breaking, and hackling). A whole room is devoted to the weaving of plain and fancy goods (Jacquard), while the next three rooms show, first, the development of the sewing machine; second, the finishing of textile products including dyeing, and third, the analyses of fabrics with testing apparatus.

Such is a partial account of the activities of the museum. The thing that impressed me most was that I, myself, unhindered, was allowed to operate so many machines and that the cutaway models showed so much of the interior mechanism that understanding was easy. One was led — even tempted — from one exhibit to another; study was play.

Munich is a city no larger than Boston, but it contains nearly 40 museums of all kinds. Some, like the Glyptothek, the Pinakothek (old and new) and the Residenz Museum, are known the world over in the field of art but the Deutsches Museum is in a class by itself, for it not only tries to please the public but its real effort is to educate it; to so arrange a system of exhibitions that every branch of science may be studied as well as popularized. To this end the Museum retains a group of scientists to study arrangement and a body of teachers qualified to take groups of students through the various departments and to accompany a visiting scientist interested in the latest developments of his specialty. The school children throughout Germany are taught of its wonders and especially interested students are sent to Munich to study in the Museum and to come back with reports of what they have seen. The Museum has a million visitors a year, ranging from all the school children of Munich to large lecture groups.

No paper about the Museum would be complete without an appreciation of Dr. Oscar von Miller, the founder and developer of the Museum. With unending enthusiasm and skill he interested the heads of the steel, chemical,



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shipping, mining, and machinery industries; he interested the emperor, kings, dukes, scientists, municipalities, and general governments until he brought together not only the Museum, but a working body of interested and able executives. You may have noticed that even Henry Ford recently fell under his spell and gave the Museum 1,000,000 marks.

Dr. von Miller, although aged, is still working. The next unit of the Museum, the library, is about half completed. It will give the student up-to-the-minute information of any technical subject and will be of the greatest use to the able scientists that plan out the Museum and transmit their knowledge to the public. A recent newspaper item mentions Dr. von Miller as now busy in planning a unified electrical power supply for Germany, linking up the brown coal mines of Bitterfeld with the great industrial centers, from Cologne and Ruhr in the west to Berlin and Leipzig in the east — all on a circular high tension line, touching all important power sources and distributing this power to every city, town, and village of Germany. Such is the man who has created the Deutsches Museum.

Industrial museums are not new to Europeans. The Conservatoire des Arts et Métiers in Paris was founded in 1799, and its first collections were simply the gathering together in the old priory of Saint-Martin-des-Champs, of the collections of royal times made by Vaucanson and the old Academy of Sciences. In England the remains of the collections of the Crystal Palace Exposition of 1851 were gathered together in the dusty, temporary buildings of the South Kensington Museum, but it was not until 1924 that the new Science Museum on Exhibition Road was opened to the public.

Here in the United States a belated but promising start has been made in developing technical museums designed to serve Americans as the Deutsches Museum has the Germans. Through the generosity of Julius Rosenwald, Chicago will in another year have such a museum housed in the reconstructed Fine Arts Building of the 1893 World's Fair. Philadelphia is working out the details of a museum to be associated with its Franklin Institute, while Washington is petitioning Congress to start one there. Much material is already available in the old Smithsonian Collections and Patent Office archives. New York already has a small museum — the Museum of Science and Industry now housed on the fourth floor of the News Building (See The Review for February, page 240), while little Doylestown in Pennsylvania has one of the earliest and most interesting industrial museums, founded by Henry Mercer. In Dearborn, the Henry Ford's museum is almost completed. It promises to be one of the most interesting and instructive places in the world with material garnered from everywhere.

It is significant to note that the original charter of Technology provides for the establishment of a museum in conjunction with the Institute. Certainly Technology could have no more fitting and tempting addition. I am tempted to say that it might dispense with half of the Faculty, should it have one. As a matter of fact, it would probably cause the Faculty to be doubled. The Institute already has here and there models and machines that would form an admirable nucleus of a museum which in our New England might at first be (*Concluded on page 306*)

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## FIFTY PFENNIGS' WORTH

(Concluded from page 305)

limited to textiles and to the graphic arts and then expanded as the opportunity offers. I know of no way in which the Institute can be of greater service to the public than by establishing the museum provided for in its charter. It only remains to find an American Oscar von Miller.

Now do you wonder that the honeymooners stopped three days in Munich to see the Deutsches Museum, when all this can be seen for 50 pfennigs?

## LIGHT FROM DARK PLACES

(Continued from page 285)

are gathering information for text books but are contributing widely to industry and to human welfare and happiness.

In some of this work it suffices to place materials in an arc and then photograph their spectra in the conventional manner. But often it is necessary to determine the spectral pattern under particular conditions which last for only a small fraction of a second, as, for example, just after the arc is lighted or perhaps immediately after the current has been shut off. It is even better to obtain a series of spectrograms taken at intervals of a thousandth of a second or much less, in order that the growth or decay of the spectrum can be studied, for changes take place rapidly during these periods. Of course, an ordinary photograph of the spectrum made, let us say, by opening the shutter just as the arc is lighted and closing it one-tenth of a second later, may indicate that changes have taken place during the lighting process. But the analysis of the spectrogram would be about as fruitful as the examination of a one-tenth second exposure photograph of the press during the printing of this page. Evidently at this stage the spectroscope's eyepiece needs to be replaced by a high speed motion picture camera.

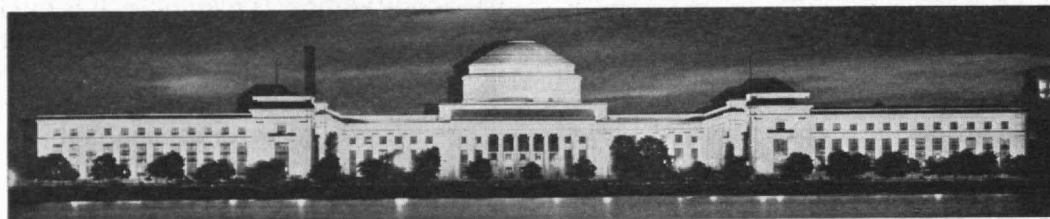
**R**EALIZING the limitations of existing spectrographic equipment in this respect, at least three motion spectrographs have been constructed, the last one having been built recently in the Institute's Physics Department shop. These have made it possible to analyze the course of a spectral process occurring in a time so brief as to be almost beyond our powers of conception. In fact, in one case in which the film was not moved as it is in the ordi-

nary motion picture camera, but was held fixed in a curved position around a rotating mirror, spectrograms were made at the rate of a million per second.

The source of radiation must be extremely bright, however, to permit making exposures in a millionth or even a thousandth of a second. Unfortunately, most sources are not so bright; in extreme cases an exposure of several hours' duration is required for each spectrogram. The method cannot, therefore, be used without modification.

The modification introduced at the Institute consists in causing the spectral process to repeat itself many times, over a period of hours, if necessary, and in passing the film through the camera again and again, always in synchronism with the process. This is accomplished very simply by clamping the film to a metal drum rotated by a synchronous motor, and by controlling the spectral emission by the same alternating current which operates the motor. With this combination, although 15,000 spectra are photographed every second, at the end of six or 60 hours — the length of time does not matter — both the camera and the source of radiation are still in step. We find a parallel state of affairs in modern electric time keeping; our synchronous clocks remain in step with the power house generators indefinitely. Because of the synchronization, the elongated spectral lines, which may be considered as being composed of the individual photographs placed end to end without breaks between them, begin and end with the same sharpness as though the drum had made but a single revolution.

As an extremely simple example of what has been studied with the aid of this apparatus, the following may be cited. The tungsten mercury arc, as many of us know, emits not only the line spectrum characteristic of mercury atoms, but a considerable amount of continuous radiation in addition. It is reasonable to suppose that a part of the latter originates in the surfaces of the hot tungsten electrodes, but since an electrical discharge through hot mercury vapor can also produce continuous radiation, there may be some question as to what part of it is due to each cause. When the arc is operated on a 60 cycle alternating current, the excitation of the mercury vapor approaches zero every 120th of a second, and therefore the continuous radiation due to the vapor must practically disappear periodically. The electrodes, however, have such high heat capacity that their temperature remains nearly constant at all times, and consequently their radiation cannot decrease noticeably during the



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current reversals. It is necessary only to take a motion spectrogram, like the one shown at the top of page 285 and then to note whether or not any part of the continuous radiation is present at all times.

Perhaps the greatest use for motion spectrograms is to be found in the study of excitation and recombination phenomena. When atoms of an element are bombarded by a stream of electrons moving sufficiently fast, things begin to happen to their internal arrangements of electrons. Because the nature of the disturbance is evidenced by the pattern of the resulting spectral lines, much interesting information concerning the processes occurring within the atoms can be obtained indirectly from spectrograms provided that they are made at the correct instants. The chief difficulty encountered in ordinary methods of spectroscopy lies in the fact that it is often impossible to maintain atoms in certain of these disturbed states for a sufficient length of time to permit observation. Fortunately, however, the atoms can be made to pass through these same conditions as often as we please, and therefore their behavior can be studied with the aid of motion spectrograms even though very feeble radiations are emitted at each stage of the process.

Our knowledge of the internal affairs of atoms and molecules is growing so rapidly that one may rightly begin to question what the research spectroscopist of the future will find to occupy his attention. There is, however, no danger of saturation, for even perfect familiarity with the structure and habits of atoms may be predicted to be a mere beginning, just as Newton's discovery marked the birth of spectroscopy. And if we can count so many advances resulting from one simple addition to the world's knowledge, what must be the consequences of the numerous present day contributions!

## REVOLUTIONARY AVIATION

*(Continued from page 283)*

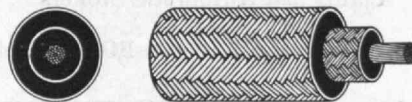
downwash from the rotor, and the propeller torque would upset the attitude of the ship.

The helicopterists have not been slow to borrow from the success of their rivals. Corridino D'Ascanio recently completed some very successful flight tests near Rome. His blades, two pairs rotating in opposite directions, are driven in flight from the engine, but they are free to rise and fall and with the engine cut off, function autogirically. An ingenious system of three little adjustable propellers driven from the blades, not from the engine, gives control about the three axes of the ship at all times. Possibly these would be a fair return to the giro people. He was able to ascend 50 feet, stay up almost nine minutes, and complete a closed circuit of over 3,000 feet, which is certainly the best practical helicopter performance to date. The Pope has ordered three of these for the Vatican City because there is not room for a large airport.

It is of course difficult at this time to estimate the true value of these aircraft. The extensive development and use of the autogiro in private flying and in transport should result in decreased fatalities and increased utility. There seems to be no immediate prospect that they will also solve the equally important problem of production and operating costs.



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## THE TREND OF AFFAIRS

*(Continued from page 292)*

United States. Mr. McClellan, former Dean of the Wharton School of Commerce and Finance of the University of Pennsylvania and a member of President Coolidge's Muscle Shoals Committee, described the engineers as "the magnificent creators of unemployment" and further pointed out their duty to find a solution for the problems for which they were primarily responsible, suggesting a continuing inquiry into the causes of depression by a permanent body rather than a one- or two-year study.

The organization of this permanent staff is to be modeled along military lines and requires the coordination of government and private agencies. The staff should include representatives of the national associations: bankers, investment bankers, the Federal Reserve Board, manufacturers, real estate boards, Federation of Labor, Research Council, Bureau of Economic Research, and utility and railroad associations.

The seven points of attack recommended in the report are:

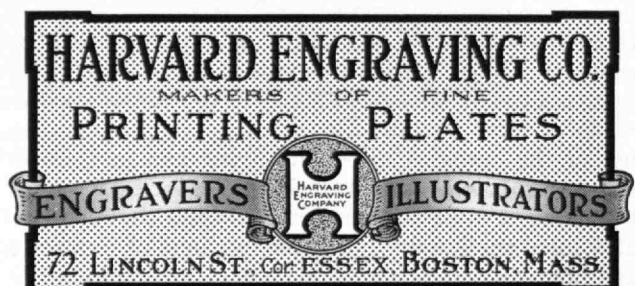
"Maintaining or increasing the consumption of goods and services; balancing plant machinery, and processes against production demands; balancing distribution agencies against consumer requirements; balancing manpower against production and distribution demands; controlling money and credit to satisfy the needs of government business, and the individual; encouraging research activity to increase human well-being through development and progress in industry and business; balancing public works against public need."

In line with the activities of the American Engineering Council, the Engineering Foundation is sponsoring research projects in science and the humanities, thus extending the sphere of their usefulness to include the human side of engineering. This study is to be undertaken in an effort to meet more adequately "the engineer's obligations in the upward progress of humanity."

"Among engineers and the public the conception of the obligations of the engineering profession is broadening to embrace the sociological together with the material aspects of the applications of the sciences through engineering and other branches of technology," according to the report read by Chairman H. Hobart Porter, President of the American Water Works and Electric Company.

Before initiating this program, preliminary studies are being made of the placement of graduates of technical secondary schools and colleges and special attention is being given to the maladjustments of this group in society. It is evident from these two reports that the engineers are at last taking definite steps in the right direction.

*(Concluded on page 310)*





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THE Division maintains a list of graduates, with records of their experience and special qualifications for engineering and technical work. A list is kept of positions open.

Alumni are urged to report promptly changes of address, or changes of business connections. Officers of local Technology Clubs and Class Secretaries are urged to acquaint the Department with information which may come to their notice of Alumni interested to make new connections, or of positions open.

Address communications to Personnel Department.

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# DIVISION OF INDUSTRIAL COÖPERATION & RESEARCH

MASSACHUSETTS INSTITUTE *of* TECHNOLOGY , CAMBRIDGE



# ADVERSARIA



## Honored

¶ MASANAO YENDO '27, by receiving the honorary degree of Doctor of Engineering from the Tokio Imperial University last June, in recognition of his work along mechanical engineering lines.

¶ FREDERIC A. PAWLEY '30, by receiving the \$150 prize offered annually by the Boston Society of Architects to students of the schools of architecture of Harvard, Technology, and the Boston Architectural Club. The subject for which the Boston Society of Architects awarded its prize was the tomb of a great musician. In 1928, Mr. Pawley won the Boit Prize.

¶ MORRIS F. SHAFFER '30, by being named a Rhodes Scholar, to enter Oxford University next October. The elections this year were conducted by a new plan, under which there was a competition in every state instead of in two-thirds of the states as heretofore. The committees of selection in the United States both state and district, comprise former Rhodes scholars except for the chairmen.

## Elected

¶ JOHN R. FREEMAN '76, to an honorary membership in the American Society of Civil Engineers on January 21.

¶ PIERRE S. DU PONT '90, to a directorship in the Pennsylvania Railroad.

¶ CHARLES HAYDEN '90, to a directorship in the American Woolen Company.

¶ JOHN M. FRANK '07, to the Presidency of the National Association of Fan Manufacturers, representing 80% of the ventilating fan and blower industry of the United States.

¶ MAURICE R. SCHARFF '09, to membership in the American Institute of Consulting Engineers.

¶ LEWIS W. WATERS '10, to a Vice-Presidency of General Foods Corporation, in charge of research and development.

¶ ARTHUR C. DORRANCE '14, to the Presidency of the Campbell Soup Company. For the past few years he has been General Manager of this company.

¶ WALTER F. POND '17, to the Presidency of the Engineering Association of Nashville, Tenn., for 1931.

¶ ROBERT I. BRADLEY '20, to the Presidency of the L-H-D Spring Corporation, makers of hair and main springs, located in Waltham, Mass.

## Bequest

¶ By GEORGE WIGGLESWORTH, Life Member of the Corporation since 1891, of \$25,000 to Technology.

¶ By HARVEY G. WOODWARD '88, of the entire Woodward estate (with the exception of his home, life annuities of \$24,000 for his widow, \$3,600 for Dr. Elmer King of New York City, and \$1,200 to his

father) to a foundation for the establishment of a series of progressive schools. The first unit of the school system is to be started by the foundation on a 4,000-acre tract of land on top of Lookout Mountain, near Fort Payne, Ala. It also was said that a second unit probably will be erected between Birmingham and Springville. Mr. Woodward recognized these schools as an experiment, and his will provides that if, after 25 years, the board of governors regards the schools as a failure, the board shall liquidate the property, turn half the funds so derived over to Technology, as a fund to be used exclusively for educational purposes, and the other half to be held in trust by the board.

## Spoke

¶ KARL T. COMPTON, recently on "Laboratory Romance" before the Iota chapter of Phi Beta Kappa at its annual dinner at Radcliffe College, and on "Your Nimble Servant, the Electron" before the American Institute of Electrical Engineers in New York.

¶ WILLIAM Z. RIPLEY '90, on December 19, before a discussion group of the National Association of Owners of Railroad and Public Utility Securities on the Advantages of railroad consolidation. Professor Ripley said: "Today, as never before, it is necessary for the railroads to obtain the advantages of consolidation. Hard times have proved that the railroads must effect every possible economy of operation. But with the strictest economy in 1930, they have been unable to earn anything like the fair return prescribed by law. It is apparent that means must be provided to make possible greater economies."

¶ GERARD SWOPE '95, on December 16, to a nation-wide radio audience concerning the methods used in the General Electrical Company to stabilize employment. Mr. Swope, who is President of this company, spoke under the auspices of President Hoover's Emergency Committee for Unemployment. He told of the plan of unemployment pensions, loans and relief which had been proposed by the General Electric Company this year and immediately accepted by its employees. This same plan had been submitted five years ago but was at that time rejected because the employees then considered "unemployment remote."

## Retired

¶ MARGARET E. MALTBY '91, from the teaching staff of Barnard College, after 30 years of association in its department of Physics. Miss Maltby, outstanding among women physicists in this country, has been Associate Professor of Physics at Barnard since 1913. She became affiliated

with the college in 1900, directly after her return from Charlottenburg, Germany, where from 1898 to 1899 she served as Assistant to President Kohlrausch at the Pysikalisch-Technische at Reischsanstalt.

## Donated

¶ By PIERRE S. DU PONT '90, \$10,000 to the city of Wilmington, to give as many men employment about the city as possible during the winter.

## Written

¶ By WILLIAM T. HALL '95, a "Textbook of Quantitative Analysis" recently published by John Wiley and Sons, Inc. Professor Hall is well known as the translator and revisor of Treadwell's famous "Analytic Chemistry."

## Opinions

¶ CARROLL W. DOTEN, Professor of Economics at the Institute, claims that the Capper-Kelly resale price maintenance bill is opposed by a majority of the economists in this country and Canada, according to returns to a questionnaire sent out. The finding is based on 523 replies from college professors, government officials, statisticians, bankers, and business men.

¶ WALTER H. KILHAM '89, claims that designs of setback buildings 1,000 feet high are played with as if they were a ten-inch wedding cake or a piece of soap. He further states: "If architects are to dominate the design of buildings must they not be modern in more than mere surface treatment? Must they not use modern materials, methods, and economies, not reluctantly, but enthusiastically?"

¶ PAGE E. GOLSAN '12, gave his views recently on the anti-trust laws claiming that they were contributing factors to the present business depression. He takes the position that over-production is caused by the inefficient, obsolete manufacturing plants which can be operated profitably only in periods of great prosperity, and against which the other manufacturers are restrained from protecting themselves by anti-trust laws that are now out of date.

## Deaths

¶ Reports have come to The Review since the last issue, of the decease of the following:

¶ CLEMENT W. ANDREWS, formerly an Instructor in Chemistry at Technology, on November 20. Professor Augustus H. Gill '84, sent in the following sketch of his life: "The chemists of the classes of '84 to '97 will remember him as an



instructor in organic and theoretical chemistry and optical analysis, and others as librarian from 1889 to 1895. Dr. Andrews was born in Salem, Mass., January 18, 1858. He graduated from Harvard in 1879, taking an A.M. the following year; thereupon he was appointed assistant in organic chemistry at the college, also assisting Ira Remsen in his investigation of the Boston Water Supply. He served as chemist for Carter, Dinsmore and Company, manufacturers of inks and adhesives, and in 1883 he became an assistant in organic chemistry at the Institute, and was made an instructor the next year. He was a well recognized authority on optical analysis, and in 1888 was appointed by the Secretary of the Treasury as special supervising agent in an investigation of the methods of polarization and classification of sugars at the principal ports of entry in this country.

"He was Secretary of the Society of Arts at the Institute, and for a number of years Editor of the *Technology Quarterly*, its official publication, containing accounts of some of the scientific work of Technology. He took charge of the chemical library in 1885 and realized that he had found his niche. He became librarian of the Institute four years later. In 1895 when the trustees of the John Crerar Library with their millions of endowment were seeking a librarian, Dr. Andrews was chosen to lead in the work of founding a library of science and art that would far surpass anything in existence, and in which he so admirably succeeded. He was made librarian emeritus two years ago.

"He represented the library at the International Conference in 1897; was President of the American Library Association in 1906; a special examiner for librarians for the Civil Service Board, and made the principal address at the laying of the corner stone of the Harper Memorial Library of the University of Chicago. In college he was a member of the Pi Eta and Phi Beta Kappa Societies, and in Chicago he was a member of a number of prominent clubs. In 1911 he received the degree of LL.D. from Northeastern University. We recollect with much pleasure our association with him as a genial, widely informed, painstaking gentleman and scholar."

¶ WILLIAM B. BRADFORD '77, on December 1, at his home in Somerville, following a few days' illness. Mr. Bradford was born in Dorchester, Mass., April 6, 1856, and was a direct descendant of Governor William Bradford of Pilgrim fame. For 25 years he was a supervising draughtsman at the Boston Navy Yard, being retired at the age of 70. For quite a number of years he taught mechanical drawing in the evening schools of Somerville. He was a member of the Bunker Hill Monument Association, the Middlesex Associates, the Point Shirley Yacht Club, the "A" Republican Club of Boston (an old political organization of historical interest), and St. James' Episcopal Church. He leaves a widow, Mrs. Anita Taft Bradford; two sons, William G. Bradford of Altadena, Calif., and Frank

R. Bradford of Sharon, Mass.; a daughter, Mrs. Grace Bradford Sumner of Somerville; also a brother and sister, George G. Bradford and Miss Mary G. Bradford, both of Cambridge. There are eight grandchildren. The funeral services were held on Thursday, December 4, Rev. Ernest M. Paddock of St. James Episcopal Church, North Cambridge, officiating, and the interment was at Forest Hills Cemetery.

¶ J. PETERSON RYDER '84, on January 10, at his home in Philadelphia. Dean Ryder was born in East Boston, July 29, 1863. He was educated in the East Boston High School and after graduating from Technology became an Instructor in Chemistry here at the Institute. Later he was named Professor of Chemistry at Tufts College, Boston. Shortly afterward his health became so poor that he was ordered to take up outdoor activities. He then entered the Boston School of Gymnastics and after graduation in 1891 he became Director of Physical Education at what is now known as Drexel Institute.

For many years he continued in that post and became unofficial adviser to the student body. He was the point of contact between the students and the faculty, and in 1923 his worth in this capacity was recognized in his appointment as dean of men. For a number of years he also served as the Librarian of Drexel. When he went with Drexel Institute, it was little more than a higher trades school. In his 40 years of service, Dean Ryder saw that school grow into a college with the highest recognition possible in the world of education; from one with slight enrollment to a school whose student body, in day and evening classes, numbers approximately 5,000 young people.

His hobbies were traveling, art, and music. Every summer during his 40 years at Drexel, he made a pilgrimage to some foreign land and was an attendant several times at the Wagner Festival at Bayreuth and the Passion Play at Oberammergau.

¶ JAMES C. T. BALDWIN '88, on December 20, at his home in Chestnut Hill, Mass. He held responsible positions with the telephone companies in New York, Chicago, St. Louis, and Boston from the time of his graduation until about the time of the World War when he was actively engaged in Red Cross work in Boston. Later he was associated with the publishing firm of Marshall Jones Company, Boston. He was an active member and officer of the Chestnut Hill Golf Club for nearly 30 years, and also a member of the St. Botolph Club.

¶ HARVEY G. WOODWARD '88, on November 18, in Birmingham, Ala. His generous bequest in behalf of education is mentioned in the first part of these columns.

¶ WALTER H. GAHAGAN '89, on December 18, at his home in Brooklyn. Mr. Gahagan studied engineering at Technology, and entered the employ of Morris and Corthell of St. Louis. He was resident engineer of Eads Bridge, St. Louis, for a time, and built seven bridges over the Snake and Red Rivers. He came to New

York in 1897 where he had charge of the New York piers of the Williamsburg Bridge with P. H. Flynn. Two years later he entered the business for himself, specializing in railroad bridge and grading work and dredging operations. He also built lighters, barges, and a floating dry-dock for the Government. His dredging work was in the Hudson River, Long Island, and New Jersey. He held patents for dredging and pneumatic caisson devices.

Mr. Gahagan was President of Walter H. Gahagan, Inc., and the W. H. Gahagan Realty Corporation, Inc., and the North Side Holding Corporation. He was chairman of the Gahagan Construction Corporation, and formerly was a director of the North Side Bank and the Manufacturers Trust Company. He was also an associate member of the American Society of Civil Engineers, a former President of the General Contractors Association of America, a 32d degree Mason, and a member of the Montauk and Brooklyn Clubs.

¶ ALMON E. NORRIS '89, on January 16, at his home in Brookline, Mass. He was connected with Mead-Morrison Manufacturing Company or some of its subsidiaries for 35 years. During his career he designed and invented many useful machines. When Mr. Norris became connected with Mead-Morrison Company, coal and ore were then being handled in one-ton units, and at the time of his death it was being handled in units of from ten to thirty tons. All of this development took place under the eyes of Mr. Norris.

¶ FREDERIC A. HILLS '89, on July 10.

¶ FREDERICK A. HANNAH '95, on December 5. During the years 1895 to 1900, Mr. Hannah was an instructor in mechanical engineering here at Technology, and at the Polytechnic Institute at Brooklyn. From 1901 to 1903 he designed special machinery. His factory experience covered two years with the Crosby Steam Gage and Valve Company, Boston. In 1906 he was associated with Stephen T. Williams, New York City, in industrial engineering. From 1911 on he followed this work individually and had business connections with a score of manufacturing establishments from New York to Montana and from Canada to Kentucky. His social and professional organizations included the American Society of Mechanical Engineers; the Engineers Club, New York City; Old Colony Club, Boston City Club, and the Engineers Club of Boston.

¶ JAMES B. HERBST '97, on October 26, at Fresno, Calif.

¶ OLIVER C. GRINNELL '97, on October 17, in New York City.

¶ ALBERT V. MOLLER '00, on November 12, in Wichita Falls, Texas. Mr. Moller was widely known as an authority on poultry.

¶ The Secretary of '01 reports the sudden death of RALPH PLUMB. As yet no details are known.

¶ PETER F. O'SHEA '09, on November 16.

¶ HIRAM M. DATESMAN '26, on November 2.

# NEWS FROM THE CLASSES AND CLUBS

1875

The Forty-Ninth Annual Dinner meeting was held at the Engineers Club, Boston, on the evening of Saturday, January 10, 1931. Of the fourteen known to be alive, seven were present. Atkinson, Dorr, Eddy, Hibbard, Homer, Lyman, and Warren. This is the largest percentage of members to attend a meeting of the Class in a half century, quite exceptional since it is 56 years from graduation. For six years after leaving the Institute no attempt to hold a Class Reunion was made and since 1881 there has been a dinner each year. When the Class society was brought back to life, Thomas Hibbard was chosen its first president and he has served continuously these 49 years.

Following the dinner came the annual meeting. The minutes of the last meeting were read and approved. Letters of cheer had come from Abbot, our emeritus banker of San Francisco; from Bush, who continues to occupy the desk in St. Louis of drainage and river engineer for the Wabash Railway, working these days as the spirit favors; from Mrs. Kilby the sad word that her husband is held indoors, an invalid from a broken hip; and from Prentiss, who with Mrs. Prentiss is spending the winter in Florida.

Two loved members of the Class have been removed from our visible fellowship in 1930; George Bowers, on February 28, and William Emery Nickerson on June 5. Each was an earnest champion of the Class, present at all reunions when their health permitted. Nickerson was one of the Institute's most distinguished Alumni and helpful friends. In addition to his numerous benefactions, he will be remembered for endowing a new professorship at the Institute, the Chair of Humanities, in which he took keen delight.

The Secretary reported on a recent correspondence relating to the firm of Aspinwall and Lincoln, civil engineers. These two members of '75 formed their partnership in 1877 and although both have died, the firm is thriving apace under the original name at 46 Cornhill. This is noteworthy, and believed to be the only instance of the kind on record in Boston.

At the last annual meeting it was suggested by Hibbard that the first ten oldest classes should arrange to have a joint dinner on the forthcoming All-Technology Reunion, rather than for each class to flock along. This idea was carried out successfully and Hibbard told entertainingly of the dinner at the Algonquin Club sponsored by J. W. Rollins, when 24 of the classes of '68 to '78 gathered around the festive table.

On motion of Lyman, seconded by Dorr, it was proposed that the President and Treasurer be authorized, empowered and instructed to make such disposition

of the funds in the treasury as they deem expedient. This was unanimously approved and so ordered. Plans are under way to present a clock to the Institute to be placed in the lounging room of the new dormitory with an appropriate tablet. Incidentally, the Class Treasury was the host on this occasion, which met with such hearty accord that it is proposed to repeat the experiment in 1932.

It is recalled that Wilfred Lewis died at sea out from Colombo, Ceylon, on December 29, 1929, returning from Japan via Europe. He had attended the World Engineering Congress at Tokyo, where he had been a distinguished delegate. On February 15, 1930, an impressive memorial service in his honor was held at the First Unitarian Church in Philadelphia. Rev. Frederick P. Griffin, the pastor, presided. He spoke feelingly of Lewis' high ideals and worth as a man of affairs, as did officers of the Philadelphia Society of Ethical Culture, the American Society of Mechanical Engineers, the Franklin Institute, and the Taylor Society for Scientific Shop Management, each of which organizations Lewis had been an honored member. Professor Buckingham was present for the Institute, and I for the Class. For 12 years Professor Buckingham had been associated with Lewis in the study of gears, for which a testing machine had been installed at the Institute by the American Society of Mechanical Engineers under Lewis' direction. These investigations have been continued to splendid purpose under the supervision of Professor Buckingham. On the afternoon of this Class Dinner I had a delightful session with Professor Buckingham who said that the forecasts made by Lewis some years before his death have been made good. He presented me with a voluminous up-to-date report on this gear research and not being a mechanical engineer, I turned it over to President Hibbard.

By far the feature of the evening was due to the request of Homer, who had asked to be on the program for 15 minutes, and this was extended to twice the allotted time, by unanimous acclaim. We were taken back to the early seventies on Homer's relations with Alexander Graham Bell, which led up to the discovery of the telephone, which was not at all looked for in the research on hand at the outstart. Reports, manuscripts, photographs, and pamphlets were shown, indicating the progress achieved, step by step, in conveying the human voice on the wire from place to place. In response to Mr. Bell's urging for the desired word for his forthcoming invention, Homer suggested "telephone" from Greek words signifying "far off" and "sound." In conclusion Homer told the success of Professor Bell's child's toy as it was reported at the Philadelphia Centennial Exposi-

tion in 1876, when renowned scientists and conservative bankers, in their profound wisdom were one in predicting that "the telephone would never become of any practical value." How many thousands have anathematized for having believed in "that sound common sense" as published in all the papers of that day!

A rising vote of hearty appreciation was given Homer for this enlightening diversion, the more enjoyable in being unexpected, which called back a crowd of sleeping memories.

A galaxy of other ancient memories was brought in review and over the cigars followed an hour of yarning on the halcyon days when we were "a bunch of lively roughnecks," as Wilfred Lewis was fond of recalling. Before adjourning the hope was voiced that each one present will report "Here!" at the Fiftieth Annual Dinner in 1932. So ended this memorable evening with fond recollections of the days when dear old Rogers housed the Institute, which was the distinguishing feature of Boylston Street.

I am on my way to Chevy Chase. These notes are hurriedly written at the Technology Club, Madison Avenue at 38th Street, New York. A series of Alumni seminars are being held at the club. The first was on electrical engineering, a grand success, at which 145 were present. The second on architecture is being arranged for next week as I write, and on March 9, one on chemistry will be held. The net result of these seminars broadens the influence of the Institute and extends contacts of mutual help to all concerned.

Yesterday I had occasion to glimpse at Gramercy Park, a favorite of landmark of mine. The one forlorn, vacant building in sight is No. 17, the one time memorable home of the Technology Club. It has not been occupied since the club moved out. — HENRY L. J. WARREN, Secretary, 4700 Langdrum Lane, Chevy Chase, Md.

1877

Henry D. Hibbard writes the following: "The enclosed clipping I believe relates to the F. P. Knott who was with us one year at Tech. I had him out at my home in West Roxbury at least once in 1873 or 1874. He was my first intimate in the Class, but I have not heard from him since; yet his name in the paper caught my eye. The account places Bali near India — about as near as England is to this country." The clipping reads as follows: "Franklin Price Knott, world traveler and artist, who had been seriously ill in Cottage Hospital since Tuesday morning, died last night of heart disease. He was 76 years old. Mr. Knott had been a prominent resident of Montecito and Santa Barbara for the last 26 years. His only living relatives are a niece, Mrs. George Wheelwright of



1877 Continued

Boston, and a nephew, Crawford Hill of New York. His wife died in February, 1926.

"Mr. Knott first won fame as a miniaturist and began to make the Autochrome pictures, for which he became widely known only after his health had failed. Some of his most important pictures were taken on the island of Bali, near India, and were published in *The National Geographic Magazine* as were his Indian pictures. As a member of the National Geographical Society, Mr. Knott traveled extensively and was acquainted with rulers in many parts of the world. Recently he was permitted to photograph royal scenes in Persia and India seldom seen by outsiders. Both Mr. and Mrs. Knott were members of Eastern families, being well known in Massachusetts, Rhode Island, and Chicago. Mrs. Knott was a daughter of the late United States Senator, N. P. Hill, of Rhode Island, afterwards owner of the *Denver Republican*, Denver, Colo."

I feel he was one of the members of our Class whose address was not known. I have written to several mentioned in the clipping, but up to the present time have received no reply. — BELVIN T. WILLIS-SON, *Secretary*, 3 Monmouth Street, Somerville, Mass.

## 1878

Away back in 1887 there was established a Class Fund which was to be held in trust for the benefit of such members of the Class of '87 as might, in later years, become in need of financial assistance. For many years this fund grew without having any call upon it from any of the members of the Class, until from a small beginning there had accrued a fund of a number of thousands of dollars. A few days ago the Secretary was in receipt of a letter from one of the Trustees of the Class Fund, which under the caption of "A Silent Example" is reproduced for the benefit of such classes as may not have established a similar fund.

"Every week a check for \$15.00 goes from the Trustees of the Class of '87 to one of its happy and most patient members, who sits in a wheel chair, his legs absolutely paralyzed and whose voice is dumb. He communicates by means of a large alphabet card to which he is able to point. He also drums out short but most cheerful letters to his classmates on a typewriter which they have provided. Calling on him is a mutual joy, for he is most appreciative, and one sees the constant loving ministrations of his devoted wife. She has even to light for him his cigarette, and he consumes no small number in the day.

"It was not, however, of this classmate that we started to write — but rather of the fund which has already provided liberally for two others and given occasional relief to several. A son of one of our Class Trustees has occasionally mailed these weekly checks. He is a graduate of Yale, and recently asked that he might take this 'Declaration of Trust of the Class of '87.' We understand it proved the pattern for establishing a

Class Fund there in Yale. Several of the Institute Classes have similar funds. From the timely and most friendly aid it has given in our Class, we, who of course, will not acknowledge it — but whom you have an inclination to call 'old men,' recommend most cordially to you kids its serious consideration for your Class, and congratulate those who have already done something of this sort. At least, we speak with the authority of experience." — Signed — One of the "Old Men."

We congratulate Guy Kirkham of Springfield on his appointment to Chairmanship of the Park Board, and we congratulate the City of Springfield in having chosen a man so capable and who is so interested in that type of development. Kirkham gives us the following interesting data: that the City of Springfield maintains 21 playgrounds, 14 baseball diamonds, 42 tennis courts, 16 picnic places, three bathing beaches, 14 community centers, a municipal golf course, and a summer camp for underprivileged children. The board is charged with properties valued at over \$7,000,000; its budget is over \$425,000. Kirkham is also a member of the city planning board. George C. Gardner '88, was chairman of this board from its inception until his death last year.

We congratulate another member of our Class upon adding at least one day to his life by having circumnavigated the globe. N. P. Ames Carter of Chicopee Falls sailed east on the fast Raymond and Whitcomb cruise just a year ago, and tells us his first stop of any length was in Cairo, Egypt. It was here that a few years ago, when going up in the elevator in Shepard's hotel he recognized our Class Beauty but looking him squarely in the face, it was very evident that the handsome man did not recognize him; but when Carter remarked that a Cairo elevator was most as slow as "climbing up the Institute stairs" Goldie wanted to know who in thunder he was talking to. Goldsmith is still handsome, but has exchanged his curly, raven black locks for a becoming iron gray, and he still knows how to dance. Another note of the trip which Carter gives us is that just as he was starting, he received a card from a Springfield friend, who was then in Chosen (Korea) saying that he had met there a voluble classmate of ours by the name of George Draper. Carter's report on India says that it was intensely interesting, hotter than the old blacksmith shop, and that the impression that one got from the contemplating — he would term them listless — half starved natives, was very depressing.

In China he had the interesting experience of being entertained in the home of an acquaintance, Dr. James Yen, at Peiping. It is Dr. Yen who is collaborating with several other scholars in selecting from the forty thousand symbols of the Chinese language, the one thousand that may give to China a simplified written language. In many of the provinces papers are being regularly published, schools in reading are being con-

ducted, and the heretofore illiterate Chinese are becoming acquainted with their own land and the world at large. During this present revolution in China, Dr. Yen had the unique distinction of being invited by the Generals of both opposing armies to come to each of their camps and teach the soldiers this newly simplified writing and reading.

The impressions brought from two weeks in Japan were that it is — at least, in cherry blossom time — one of the most beautiful spots on earth, and that the country of the gay and busy little Japs is a most delightful one to visit. The greeting to the tourist, on our own islands of Hawaii, excel in cordiality all ports of the world. You are met with a brass band, singers entertain you as the ship docks, you are bombarded with flowers, and (listen to this, George Draper) as you step from the gang plank there is a row of pretty Hawaiian girls placing wreaths of flowers on the neck of every passenger. It is all so different from the raucous cry of "Taxi! Taxi!" One feels immediately that someone is glad to have you come, even if it is an activity of the Hawaiian Chamber of Commerce.

Classmates will learn with great regret that Henry D. Sears is now located at Schenectady, N. Y., where his address will be the Mohawk Club. We certainly hope that he can negotiate the distance between Schenectady and the Hub on the occasions of Class dinners and reunions, for a meeting ungraced by the presence of the one who is "still the handsomest man in the Class" would be unthinkable. — EDWARD G. THOMAS, *Secretary*, 1940 Calumet Avenue, Toledo, Ohio. NATHANIEL T. VERY, *Assistant Secretary*, 96 Bridge Street, Salem, Mass.

## 1889

The New York Evening Post of December 20, had the following: "Walter H. Gahagan, construction and dredging engineer, died Thursday night, December 18, of heart disease at his home 17 Prospect Park West, Brooklyn. He was 66 years old. His daughter, Miss Helen Gahagan, star of 'Tonight or Never,' now playing at the Belasco Theater, finished the performance as usual and appeared again last night. Besides Miss Gahagan, his wife, Mrs. Lillian M. Gahagan; three sons, William C., Frederick M., and Walter H. Gahagan, Jr.; another daughter, Mrs. Lillian G. Walker, and six grandchildren also survive. Burial will be at Troy, Ohio, where he was born in 1864.

"Mr. Gahagan studied engineering at the Massachusetts Institute of Technology, and entered the employ of Morris and Corthell, of St. Louis. He was resident engineer at Eads Bridge, St. Louis, for a time, and built seven bridges over the Snake and Red Rivers. He came to New York in 1897, where he had charge of the New York piers of the Williamsburg Bridge with P. H. Flynn. Two years later he entered business for himself, specializing in railroad bridge and grading work and dredging operations. He



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also built lighters, barges, and a floating drydock for the government. His dredging work was in the Hudson River, Long Island, and New Jersey. He held patents for dredging and pneumatic caisson devices.

"Mr. Gahagan was President of Walter H. Gahagan, Inc., and the W. H. Gahagan Realty Corporation, Inc., and the North Side Holding Corporation. He was chairman of the Gahagan Construction Corporation, and formerly was a director of the North Side Bank and the Manufacturers Trust Company. He was also an associate member of the American Society of Civil Engineers, a former President of the General Contractors Association of America, a 32d degree Mason and a member of the Montauk and Brooklyn clubs."

We regret to announce the death of another one of our classmates, Almon E. Norris. The following account was in the *Boston Transcript* on January 16, 1931: "Almon E. Norris, a prominent mechanical engineer, died suddenly at his home in Brookline, January 15. He was connected with the Mead-Morrison Manufacturing Company, or some of its subsidiaries, for 35 years. He had been chief engineer of this company for 26 years, since its incorporation, when it absorbed the Rawson and Morrison Manufacturing Company, with which Mr. Norris was identified."

"During his career he designed and invented many useful machines. As a designer he was known throughout the United States. He took high rank among mechanical engineers of labor saving machinery, and many of the machines he designed are widely used. When Mr. Norris became connected with the Mead-Morrison Company, coal and ore were then being handled in one-ton units. At the time of his death, it is being handled in units of from ten to thirty tons. Today, many a storage runs from 1,000,000 to 1,500,000 or more tons. All of this development took place under the eye of Mr. Norris."

"Mr. Norris was married twice. His eldest son, Jack, entered the service during the war as an aviator and was killed while flying in Florida. His daughters, Miss Grace and Miss Ruth Norris, survive. For his second wife he married Maud Conrad, in 1905. Their children are Pauline, Evelyn, Albert, and Oriol Norris, all living in Brookline."

Tuesday, March 10, is the date of the next Class Dinner. Make a note of it now. Full information will be released soon. — George Alley has been quite ill, but at this writing is much better. — Mauran's firm (Mauran, Russell & Crowell) have been appointed architects for the new Federal Building at Twelfth and Market Streets, St. Louis, Mo.

The Secretary has received news of the death of Frederick A. Hills. His last address was Marine Hospital, Cleveland, Ohio. — WALTER H. KILHAM, Secretary, 9 Park Street, Boston, Mass.

## 1891

A letter from Hanington in Denver states that he is selling out of the Mountain Motors Company and asks us to use

his home address, 360 Gilpin Street. He says his son wore his old Tech uniform and cap to a fancy dress ball; how many of us have our uniforms?

Clark is Secretary of the United States Institute for Textile Research, Inc., with headquarters at 65 Franklin Street, Boston. Dr. Stratton is President, A. F. Bemis '93, and Albert R. Pierce '91, are directors. — At the meeting of the Technology Alumni Council on October 27, S. W. Wilder '91 was a special guest on account of the completion of his five year term as member of the Corporation. He made a short but telling speech, describing his experiences, and stressing the importance of having men on the Corporation who are interested in furthering the interests of the Institute and who are willing to spend some time on the work. Dr. Stratton paid Wilder a great tribute and said he found his advice and counsel of great help to him.

Shattuck writes from Indio, Calif.: "I had a mighty nice visit here recently with Charlie Garrison, Mrs. Garrison, their son Robert, and his wife and little son. They were all first rate and seemed to enjoy their experience here among the desert sand dunes. They had a little engine trouble on their way home, so were delayed long enough to see a glorious desert sunset followed by the beautiful moonlight and the appearance of weird forms against the mountains and upon the plains."

"So you don't know where Indio is, hey? That's strange. Well, it is just three miles from Coachella, and it's getting more like New York every day. On the other hand, it is only 16 miles from Palm Springs, or rather 23 miles, I should say, but what are seven miles anyway on good pavement? You know Palm Springs, of course, the winter playground on the desert, with several elegant hotels. All rich folks do. I am playing pioneer here, mostly for the fun of it. Indio is 23 feet below sea level. I am seven miles west of Indio on the road to Palm Springs, and at an elevation of about 100 feet above sea level. Come out by airplane some time and drop in on me."

Charlie Aiken writes from Sydney: "I shall not be able to attend the March dinner of the Fraternity in Boston as I hardly expect to get back before the latter part of April. I plan to leave here February 18 by the Dutch line for Java and Singapore, then go to Manila and China, Japan and Honolulu, and then to Los Angeles, then to San Francisco, Portland, Seattle, and Vancouver. I expect to go over to New Zealand for a month before I start back. Of course, my plans may be all changed. I plan to attend the Class Reunion in June."

Jim Swan wrote Barney that all was well and no special news. He took an auto trip to Montreal, Ottawa, and the Adirondacks, and saw Henry Birks in Montreal (Birks must see quite a few '91 men). — A letter from Robert Ball to Barney says: "We moved into a new house in the summer and find it more convenient than the old one which served as home for 20 years. It is not far

away but in a quieter neighborhood, as our old house was on a main highway and very noisy. I hope the ranks of '91 have not diminished during this year, though I am without any particulars. No doubt there will be a Fortieth Reunion next year at which I would like to be present, but I fear it is impossible for me to come. It occurs to me that possibly some of our classmates might be on this side of the water in June and we could arrange to foregather, either in Paris or London. You would doubtless know if any would be over here and I would be much obliged for a timely intimation. I am writing to Gorham Dana also in regard to this possibility. I took a short holiday in Ireland this summer, my first visit to the old country for ten years."

Hartley White wrote from St. Louis in January, that he was attending an American Road Builders Convention. Men were there from Canada, Mexico, and South American countries as well as some from Europe. Probably 20,000 represented the United States alone. There were 450 carloads of machinery on exhibit.

Jerry Campbell wrote Barney about his recent trip to Mexico: "The climate there is simply perfect, sun and blue skies every day with only an occasional shower during a part of the year, and thermometer about 70° all the time. The scenery is very beautiful and very grand. Every street in Mexico City is stopped by a mountain and some of them are snow-capped. The city is very foreign and very interesting. All buildings are of stone and brick of the villa type like the best of those in foreign cities. Except in the old city which is the business section, the streets are wide boulevards with four lines of trees and many attractive monuments, parks, and fountains. One can see more foreign things in Mexico than in any other one place I have ever seen."

Charlie Garrison wrote from Long Beach, Calif.: "We five," which includes Robbie, went on a 240-mile circuit and ate our dinner under dripping pines 7,000 feet in the air. It was a rainy day but we went to San Fernando, Newhall, crossed the Santa Clara river-bed where the flood was a couple of years ago at the breaking of a big dam, and then up Mint Canyon. We were on the edge of Antelope Valley and continued on the flank of the San Gabriel Range which rises from the Mohave Desert. Another long canyon, Shoemaker, with grades 10 and 12%, brought us to Big Pines Recreation Camps. These belong to Los Angeles where they have summer and winter sports. Some snow and ice was about the swimming pool and the temperature was 40°. We warmed ourselves at the main building which had a large fireplace at each end of the big room, and heard the football game over the radio. The rain ceased as we came down from the summit and we joined the main road over the Cagin Pass and arrived at San Bernardino."

"The 70 miles to Long Beach was easily made and we arrived just after sunset. I had a letter from Charley Aiken and I am delighted to learn that he will return via

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California so I shall probably see him in March. He sent me a picture of Sydney Harbor Bridge. When I learned that it was taken from the Zoo, I was worried and asked him how he escaped! I said I could see the sign on his cage, 'the only M. I. T. ninety-oneder in captivity.'

"I had a note from George Hooper and he is seriously thinking of being present at the Fortieth. Margaret is just landing at Alexandria, Egypt, after three days' on the Mediterranean and will be in Cairo about a month. Then she joins her aunt at Syracuse and they will spend a couple of weeks in Sicily. At Naples they will pick up the Ford and begin their tour of Italy, France, and England."

Will Bassett wrote Barney a long letter in December, telling about his recent business (and pleasure) trips, apparently made in his official capacity as President of the A. I. M. & M. E. Some of the high spots were that he saw Walter Hopton '91 in Syracuse and addressed the Central New York Purchasing Agents Association; saw Jordan '91, in Syracuse; spoke at a luncheon meeting of the Chicago Engineers Club where he saw Morris Knowles, and also spoke that evening at a meeting of Mining Engineers. Last summer he visited the copper country in Michigan and the Iron Range in Minnesota. On a western trip he visited the Colorado School of Mines, Utah Copper Company at Bingham, and had dinner with Senator and Mrs. Smoot at Salt Lake City. In San Francisco Professor Hersam '91, entertained him at luncheon at the University Club. He visited Leland Stanford, University of California, and California Tech where Dr. Noyes is located (our professor in chemistry). At El Paso he attended a joint meeting of the S. W. Sections of A. I. M. & M. E. and the American Mining Congress. As Will says, he has had a busy year and his letter is most interesting.

Will Wilder's daughter, Rachel, was married on December 23, to Harry F. Bliven of Bronxville, N. Y., where they are to reside. — Don't forget the Fortieth Reunion the second week in June. — HENRY A. FISKE, *Secretary*, Grinnell Company, 260 West Exchange Street, Providence, R. I.

## 1893

At the dinner tendered President Compton, December 8, by the Technology Club of New York, '93 was represented by the following: Mr. and Mrs. H. R. Barton, G. T. Blood, Mr. and Mrs. A. G. Davis, Mr. and Mrs. J. A. Emery, D. D. Jackson, F. H. Keyes, H. N. Latey, F. W. Lord, and A. B. Wadsworth.

Fridays, March 27 and May 29, are the dates of the remaining bi-monthly Class luncheons in New York City, which for the past two seasons have been carried out so effectively under the chairmanship of James A. Emery. These luncheons, at one o'clock, are held at the Railroad Club, 30 Church Street, where a room is reserved in Emery's name. Not alone New Yorkers, but out-of-town men particularly are urged to come. Get in touch with J. A. Emery of Ford, Bacon and Davis, Inc., 39

Broadway, New York City — telephone Digby 3200. Advance notice, while helpful, is not necessary.

From Charles E. Buchholz, at Saranac Lake, comes good news with his New Year's greeting to the Class Secretary. He writes under date of January 7, 1931: "I have been out of touch with Technology as well as nearly all other business matters for nearly three years and it is only recently that I have again taken an active part in the affairs of the coal companies in which I am interested. In 1933 Mrs. B. and I will make it a point to attend the reunion; the last one we went to was our Thirtieth.

"This place is a delightful 'haven of rest,' brilliant atmosphere, 18 inches of snow at an elevation around 1,800 feet surrounded by mountains running up to 5,000 feet. Here we have a village (not a city or town) of 8,000 people; at least half of the population are health seekers from all over the world; a hopeful, happy crowd from millionaires to those who depend on help from their friends. It is wonderful how many charitable people there are whose good deeds are never heard of.

"If I can arrange my business I should like to call this home; at any rate I must stay here at least another year. Remember me to any of the '93 boys whom you see and drop me a line when you feel like it." His address is 49 Helen Street, Saranac Lake, N. Y. — FREDERIC H. FAY, *Secretary*, 44 School Street, Boston, Mass. GEORGE B. GLIDDEN, *Assistant Secretary*, P. O. Box 1604, Boston, Mass.

## 1895

Reunions are a great rejuvenator to those who will and can attend, and this was strikingly manifested at our Thirty-Fifth Reunion at Plymouth, Mass., last June. Everyone had such a good time, that it prompted the New York contingent to hold an extra reunion in New York City on January 24 and 25. These notes go to press before your secretaries can give you complete details; however, there will possibly be a total of forty '95 men with their wives and family, who will get together at Hotel Gramatan, Bronxville, N. Y., Saturday and Sunday January 24 and 25. This reunion will be called the Thirty-Sixth, and is sponsored by the New York boys. Mr. and Mrs. T. B. Booth, Mr. and Mrs. H. D. Jackson, and Mr. and Mrs. L. K. Yoder will attend from Boston, and Mr. and Mrs. E. C. Alden will come from Hartford, Conn., and Mr. and Mrs. J. H. Gregory of Baltimore have accepted. Those who abide in and around New York will be on hand. Full particulars will be forthcoming in the April Review, so watch for this number.

For the benefit of the Class members who are some distance from Boston, we quote from the financial section of the Boston *Herald* of January 1, the business survey from two of our most prominent industrial executives — Alfred P. Sloan, Jr., President, General Motors Corporation, and Gerard Swope, President, General Electric Company. Al Sloan states:

## THE TECHNOLOGY REVIEW

"As we enter the new year it is important, I believe, for us all to look ahead rather than look behind. Even though we may carry over some problems from 1930, the new year will demand a different approach to these problems and a different mental attitude toward the future.

"Throughout 1930 every one was engaged in comparing conditions at home and abroad with conditions prevailing in 1929 without realizing that 1929, in one way, was as abnormal as 1930 was in another way. Comparisons, under these conditions, were not sound. Optimism and pessimism were both exaggerated. But 1931 is a new year. We should enter it with new ideas, new measures, new confidence, and new hope. Business this year will be exactly what we make it — no better and no worse. It is largely within the province of the American people to restore the economic equilibrium of the world, and if our attitude toward the new problem of the new year is constructive, rather than critical, we shall make greater progress in 1931 than we did in 1930."

Gerard Swope tells us: "It is always difficult to look ahead, and particularly so this year. We, in the electrical industry, possibly have had more to be thankful for during the last year than those in many other lines of endeavor and this may also be true of what the future holds for us. New methods in industry, with electricity as their base, are being continually introduced; new uses are constantly being found for electrical apparatus and appliances in the home and new devices are being developed to meet these needs.

"The statistics of the electric light and power companies throughout the United States for 1930 reflect these tendencies, showing that there has been a slight decline in the use of electric power by commercial organizations and in the industry, and that the electric energy used in the homes, even in this year of depression, has increased over last year. We expect this course to continue, and therefore look forward with confidence, believing that the electrical manufacturing business, as a whole, in the new year should surely be no worse and possibly somewhat better than in 1930."

Frank A. Bourne with Mrs. Bourne sail for a cruise in the West Indies during early February. Frank will give us his experiences and impression for The Review. — The Secretary of your Class has *not* changed his address, and also remember he enjoys getting news from all of you. — LUTHER K. YODER, *Secretary*, Chandler Machine Company, Ayer, Mass. JOHN H. GARDINER, *Assistant Secretary*, Graybar Electric Company, 420 Lexington Avenue, New York, N. Y.

## 1896

The first return for the Reunion at Osterville next June is in. Frank Hersey telephoned January 3, as a result of reading the Reunion announcement in The Technology Review, to say that he planned to be present in June and to bring along Myron L. Fuller. He also hoped to



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prevail upon Harry Gilman and Lewis Tappan to attend. Jacobs also has written from the University of Vermont that he will be a Reunioner, but that his college duties are keeping him so busy this year, together with shoveling the large amount of snow which that district has had this winter, that he does not see how he can get away for his annual spree in Boston during the winter or spring.

The Secretary started the New Year right by calling January 1, on Charlie Morris at his home 15 Egmont Street, Brookline. As retired Rear Admiral, life flows along very evenly for him. Last summer in a burst of enthusiasm he started to play tennis, which he had not played for a decade. He got rather strenuous and twisted his heel and has been gradually recovering ever since, now having reached the point where he is able to walk half a mile without discomfort. He has changed his method of recreation to the indoor sport of assembling jig-saw puzzles at the moderate rate of one puzzle three feet square per month. Mrs. Morris helps him, so that he is not tempted to overdo.

Dr. Rockwell was in attendance at the meeting of the National Collegiate Association in New York City during the week between Christmas and New Years. His special interest was the wrestling rules. — Another long lost '96 man has been located in the person of Frederick W. Andrew, who is at Glen Head, Long Island. He was with us in our freshman year and will undoubtedly be remembered by many men who were in sections with him. He is now a consulting mechanical and electrical engineer, but for some years after leaving Technology he was engineer on arc lamps for the Western Electric and Manufacturing Company, and later assistant chief engineer with the Dayton Engineering Laboratories, the Remy Electric Company, and the Eismann Magneto Corporation. During the war he was aeronautical mechanical engineer in the Bureau of Air Craft Production, and was directly responsible for 85% of the truck ignition. In the course of his career he has secured numerous patents along a wide line.

Young Joe Harrington, who is now a graduate student of Technology, called upon the Secretary after the holidays to report that he had been home during the vacation, and had found that his father had been very seriously ill with flu, but was on the way to recovery. His mother also had been attacked but had not had so bad a case. The fellow who has been working '96 men for money telephoned Joe one day while he was ill at home, but Joe turned him down, and thus fortunately escaped being made another victim of the fellow's scheme.

Billy McAlpine has now become a double grandfather, as the result of the recent arrival of a new grandchild. — A greeting card from Myron and Mrs. Fuller announced that having been home in Brockton ever since last September, they were again starting off at the beginning of the year for a trip via Haiti and Curacao to Venezuela, where they

plan to ascend the Orinoco to the head of navigation and later see what they can of the rivers of British and Dutch Guianas. This means that when the Fullers return from this trip their first job will be to supply a report not only of it alone, but also of their trip to northern Europe last year. The Secretary confesses his negligence in having failed to secure the report of the European trip while the Fullers were home.

Jim Melliush wrote early in the year that he was around New York City last summer, but finding business rather quiet in the line of sanitary engineering he had "gone Ingeniero" again with Parrish at Barranquilla, Colombia, where he has a job that should keep him busy until March first at least. He had been suffering from a form of malaria during December, which had kept him in the house and in bed for some time, but when his letter was written he was feeling a little better.

Dr. Allan W. Rowe, the gracious and courteous chairman of the Technology Advisory Council on Athletics, has written a formal vote of thanks to the Class of '96, acknowledging in his usual elegant language, and assuring us of his deep appreciation of the kindness and generosity of the Class for their contribution, which will be the greatest possible aid in carrying on the work of the undergraduates' athletics.

The Ansonia (Conn.) *Sentinel* in its issue of December 31, reported the promotion of W. T. Dorrance to the position of assistant to the chief engineer of the New Haven Railroad, and also gave an outline of Dorrance's career from the time he graduated from Brown and Technology, and started as a rodman on construction work for the South Station in Boston, and gradually worked up through different positions along engineering lines with various railroads, having been with the New Haven Railroad for the past 14 years.

Another newspaper clipping from the Kansas City *Star* last November devoted considerable space to the doings and accomplishments of Guy Wall, or Colonel William G. Wall as they prefer to call him. He told the story of the part that he played in the development of the old horseless carriage into the modern automobile, and also about his work in the development of the submarine. He was in Kansas City in connection with important patent legislation. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M. I. T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1897

John Macomber, President of Harris Forbes and Company of Boston has been elected a life member of the Institute's Corporation. — Word has just been received by the Secretary of the death in Fresno, Calif., on October 26, 1930 of James B. Herbst, Course VI. Everyone will sincerely regret the passing of Jimmie. — Oliver C. Grinnell of 227 Park Avenue, New York City died on October 17, 1930.

Jere R. Daniell, XIII, has been located in Madrid, Spain. We do not know whether Jerry was mixed up in the recent attempt to overthrow King Alfonso or not, but we do know that whatever Jerry was doing he was doing it well. — Arthur Hopkins who holds forth as a management engineer at 10 State Street, Boston, has a farm on Cape Cod which has been in his family for a couple of centuries. There is a good sized wood lot which is being gradually made into a wood pile by Hopkins' efforts during these days when jobs are few and far between. He pretends that he likes it! We hear he averages about every other week-end there. Benny Howes has visited him and any other friends are always welcome.

The following came in from Luzerne S. Cowles: "After keeping out of The Review for 33 years, except for the appearance of my name as being present at numerous Class functions, there is little record unless the existence of a wife and three grown-up children may be considered of importance. After graduation one year with Boston Bridge works, one year travel abroad, 18 years with Boston Elevated, and 13 years with Stone and Webster, makes a total of 33 years of continuous activity. Health good, habits medium, golf poor. My New Year's resolve is to continue my attendance at all Five-Year Class Reunions as long as I'm able to drag around."

The following was received by our Assistant Secretary from C. D. Hubbard, which we know will interest everyone: "I had forgotten all about my rash promise, until your letter was received shortly after my return from South Carolina. I note that you ask for a few lines regarding my recent hunting trip or 'my work.' There is so little of the latter these times, that I hurried back from my trip for fear the Company would discover how well they could get along without me. I will, therefore, confine myself to the shooting expedition.

"Hunting is the one thing from which I seem to get the same kick as in my boyhood days. There is the pleasure of anticipation, the pleasure of being in the field with good dogs and a good companion or two, and much pleasure in thinking it over afterward in leisure moments. I have a good friend in South Carolina and every fall I get a letter telling me of the prospects for birds and that he is expecting me. So I usually save my vacation until sometime in December and then hie myself to the sunny south for a couple of weeks of hot biscuits, fried chicken, hominy grits, and so on.

"December is a wonderful month in South Carolina. Something like our October. Just enough tang in the air to make it a pleasure to be in the field. My luck on weather has been almost proverbial, for by actual count I have lost just two days hunting in ten trips each of at least ten days. My Buddy and I are not as young as we used to be, so content ourselves with hunting in the afternoon from about two o'clock until dark. This was just enough to make the 'hay' invit-



1897 Continued

ing at night and still leave us keen for the sport the next day. The quail, or partridge as they call them down there, are not as plentiful as they used to be, but for a man who enjoys seeing dogs in action, there were enough to make it interesting. The number of coveys found in an afternoon ranged from two to nine and the number of birds in a covey from six to fifteen.

"We hunted one rangy pointer named Joe that traveled like a race horse. He sometimes ran over and flushed a covey before he winded it, but if there were birds within a quarter of a mile of you, he would find them. It was a beautiful sight to see Joe traveling at top speed and suddenly wind birds. On would go the four wheel brakes, he would swing his muzzle from side to side and then start to creep up. I have seen him go well over a hundred yards before he clamped down on birds. And then the thrill of walking up behind the dog, knowing that a bomb shell was going to explode five or ten yards ahead of the dog. And when the bomb explodes it takes concentration to pick out an individual bird and pay no attention to the others until you have downed him. Once in a while I would get one with each barrel, and begin to think I was pretty good, and the next time nothing but the ambient air. Down South with those Nimrods that is more a disgrace than taking a 'windy' playing golf.

"The country was as flat as a table, with corn fields, cotton fields, pines and innumerable little branches with plenty of cover, consisting of scrub stuff, vines, and briars. The birds go out in the fields to feed, but never get very far from good cover. When the covey is flushed they usually scatter more or less and go for the heaviest cover within a quarter of a mile. Marking the singles down and finding them was a tough proposition and we were not very successful at it.

"Once in a while early in the season before the birds have cut their eye teeth, when flushed all will go in the same general direction and light in the broom straw. Then what you can do to them is a sin. The dogs can stand them one at a time and a fair shot has no excuse for missing. We would wind up at the car just about the time it was too dark to shoot and nearly always could hear scattered birds in the neighborhood calling to each other, trying to get together for the night. A thing that always impresses me is how much more daylight they have in the afternoon in winter than we have in Boston. It was almost as light there at six o'clock as at five with us. I was surprised on looking at the map to find that we were almost directly south of Cleveland.

"One day we took the Game Warden with us. He had only one arm, but the way he could handle a 20 gauge pump gun was a caution. Driving back after dark, cold and tired, with the Game Warden in the back seat with the dogs, a southern drawl came from him saying 'Mistah Hubbard, how would you like a drink of cohn likker—its kinda mean.' I allowed I would take a chance—and

it was mean. I thought for a minute I had swallowed a blow torch. However, it certainly warmed me up." — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES A. BRADLEE, *Acting Secretary*, 261 Franklin Street, Boston, Mass.

## 1898

In a recent issue of these notes we listed fourteen '98 men whose names are given in the 1930 edition of "Who's Who in America." In the *Tech* for November 7, 1930, we read that of the 29,000 biographies in "Who's Who" are those of 240 graduates of Technology. The Institute ranks eleventh, Harvard, Yale, and Princeton coming first, second, and third.

We note that Bryce Metcalf, a retired banker, was married to Mrs. Elizabeth B. Glover, November 10, 1930. The couple will live in Scarsdale, N. Y. — Elliott Barker sent in the following clipping: "A veteran has been ordered to put aside his arms in the interest of his physical well-being. Not a veteran of warfare with guns, but an old-timer in strife with driver, midiron, and putter. W. C. Fownes, Jr., national amateur champion in 1910, has been advised by his physicians that a heart ailment precludes further golfing. Fownes, ill at his winter home at Pinehurst, N. C., is now 53 years old."

Paul Johnson writes the following on letter paper bearing a picture of his power cruiser *Seyelyn*. Please note that he corrects a mistake we made in a recent issue of these notes concerning Wightman: "I am very glad to see so much '98 news in The Technology Review in October and December. I have done little cruising this summer. Did not go to Alaska as intended. I did attend the Pacific Coast Championship Regatta at Newport Bay in August and won the 90 mile around Catalina Island power cruiser race. There was held there the first Annual Christmas Regatta, December 26 to 28. I came in second in the 50-mile power cruiser race, losing by three seconds. Was third in an impromptu handicap race twice around a 7-mile course. A bad start was responsible. I never quite understood the starting systems used in these races and they seldom seem to work just as stated in the programs, so when I saw a big red flag, I thought it meant 'road closed,' 'detour,' 'stop,' or something, so I stopped, until waved to go ahead. Being the fastest boat in the race, *Seyelyn* had the lead. I did not know just where the markers were, so went around, all flags seen including a red flag put out by some fisherman and a red sweater in a fish boat. I had a pretty good joke on myself, I thought. I was very much surprised to receive the third prize, a pewter cup. Now *Seyelyn* is laid up to overhaul engines and get ready for the San Francisco race next April.

"Referring to the item about Ben Hinckley in the December Review. Somebody got mixed. I wrote to Wightman and found that he is Frederick Wightman '99, not Edward E. Wightman '98, as Hinckley supposed or you

understood him. Frederick Wightman is a fine chap, though. He asked me to drop in on him, which I hope to do before spring."

On September 4, 1930, when the Aptuxet Trading Post at Bourne (on Cape Cod) was officially opened, Percival Lombard, President of the Bourne Historical Society, accepted the key. This trading post represents the original one that stood in the same secluded area more than 300 years ago. — There was quite a long write-up of Seth K. Humphrey in the Boston *Transcript* of April 5, 1930, parts of which might be interesting to fellow classmates. "... While the young body was at work on this all-night shift the young mind was at work on an invention that would make labor easier in a mill. He invented a new form of elevator for flour mill employees, and for many years thereafter, 'self and pocket-book were kept thin trying to impress the merits of the invention upon captains of the milling industry. The net result for me was a low-down opinion of their ability to recognize a good thing. Since then, this machine has come into general use in large flour mills the world over, and I regard it as my one enduring achievement. Several other patents, alas! share the dust of oblivion with my rejected manuscripts.' The young inventor had harder luck than the author, for Seth Humphrey's first book was promptly accepted by a Boston publishing house. This was 'The Indian Dispossessed.'

"He was 31 years old when he entered the Massachusetts Institute of Technology, not only because he had always wanted to know about chemistry and electricity, but also 'because that seemed to be the only seat of learning willing to accept my extra years in lieu of impossible entrance examinations. Their sole requisite was that I keep up with the youngsters. In a career somewhat given to taking chances, this was the dizziest adventure with the unusual, and I am still wondering why I was not fired before I got adjusted. These were the greatest two years I have ever spent before or since.'" Seth recently underwent a serious surgical operation at the Palmer Memorial Hospital, Boston, but he is now out of the hospital and is doing finely.

A card received by Professor C. E. Locke '96, during the holiday season from George T. Cottle reports that he was in the South Seas and so far had stayed single, although he had passed through some alluring moments. He was having some very interesting experiences and a most enjoyable trip. The card was mailed from New Zealand, whence he planned to depart shortly for Australia and thence on to the Indies.

The following is from E. F. Morrill of the Ohio Bell Telephone Company in Columbus: "The 1896 Class news in the January issue of The Technology Review refers to a young scamp representing himself to be the son of a member of the Class of '96. He has apparently graduated from '96 and is now taking a post-graduate course with '98, as he called on me the

1898 Continued

latter part of November probably after having interviewed Smith, '96, at Mansfield, Ohio. He had the same kind of a story reported by Howe at Houston, Texas. He had been in an automobile accident in a small town east of here and had enough money for a ticket to Chicago, but not enough for berth and meals. He was on his way back to Madison, Wis., where he was studying medicine. In this case, he claimed to be the son of F. P. Bergen, and that he had met Frank Kellogg and some of the other fellows at a recent reunion in Boston. As his acting and the facts he hands out can't help taking you in and although it is a fine racket for relieving the unemployment situation, I feel the other members of the Class should be warned against him." — ARTHUR A. BLANCHARD, *Secretary*, Room 4-160, M. I. T., Cambridge, Mass.

## 1899

My last appeal for news fell on sympathetic ears and the Class of '99 starts the year with several items in the news folder. First and foremost is the story of H. K. White's sojourn in Europe, a story so interesting that I am letting him tell it in his own words. "As I noticed in the December Review that you had promised to report further news from traveling members of the Class, I am constrained to help you keep your promise, particularly in view of the receipt of your letter of the eleventh. Perhaps my contribution, like occasional jury service, will for a time make me immune from further appeals for news.

"In any case, I am sorry I did not know that Norman Rood was in Paris for his health in the early summer, for at that time I was there myself, and would have been delighted to 'take the cure' with him, though I really crossed for quite another purpose. With our boys' summer plans satisfactorily settled, Mrs. White and I, with our car, sailed for Europe early in June. We all returned safely about the first of September. In the meanwhile we had enjoyed three months' of motoring through France, England, and Scotland.

"Landing at Havre, our itinerary took us first to Paris via Rouen, a city especially appealing to an architect. After two weeks in and about Paris, we turned south to the valley of the Loire, with its marvelous chateaux, its cliff-dwellers and sparkling Vouvray. I'm not sure but the Vouvray rather than the instruction of the patient Leon Bernard, prompted me one day after a delightful repast, to say to a kind though astonished host, 'Jamais les Français,' when Mrs. White promptly explained I had of course intended saying, 'J'aime les Français.' Be that as it may, Vouvray is recommended whenever obtainable.

"We followed the Loire nearly to the Bay of Biscay, turning west at Nantes into Brittany. Several days were spent at the delightful little fishing village of Concarneau full of riotous color. Then we journeyed to Quimper, to Finisterre and back to Havre following the coast with stops at Morlaix, Dinan, St. Malo, Mont St. Michel, Caen, and Deauville.

"At Havre we crossed the channel to Southampton for a trip through rural England. This took us to many places of absorbing interest not easily reached except by motor. We turned northward almost at once after a glimpse of Winchester and Salisbury. A few days were spent in and about Bath, another city of unusual fascination. We then visited Stratford, Warwick, Litchfield, the Derbyshire Country and the English Lakes. By this time Scotland was but a few hours away, and its lure too strong to resist. Though unpursued, we crossed the border at Gretna Green, and after a day's run were skirting the shores of lovely Loch Lomond. Here we mixed in a few mountain passes. Having reached the summit of one of the most difficult, a roadside sign advised us to 'Rest and be thankful.' We followed the suggestion before coasting down the other side to Loch Awe. From Loch Awe our trail followed the westerly coast of Scotland northward to the Caledonian canal. It was along this shore that we enjoyed our most inspiring scenery. Eventually we found ourselves at Inverness, where at eleven P.M. we watched several anglers in the middle of the River Ness casting their flies for the elusive trout.

"We turned south reluctantly, stopping at Glen Eagles en route to Edinburgh. Glen Eagles is my choice for our Thirty-Fifth Reunion. If any member of the Class knows of a more beautiful or inaccessible spot, let him speak or forever hold his peace. It is the last word in comfort, and a golfer's paradise. Let's charter the *Berengaria* or the *Robert E. Lee* and perfect our game in Scotland. After a few days in Edinburgh, we resumed our travels, with a day each allotted to the charming cathedral towns of Durham, York, and Lincoln, with another to Cambridge, always a delight and an inspiration. When perhaps ten miles from London, we turned for the first time to one of the always courteous R. A. C. men for information as to the best route into the city. This was promptly given with instructions to go by way of Swiss Cottage, thus avoiding the trams. Swiss Cottage, however, became conspicuous by its absence. We finally pulled up to the curb and ventured to inquire the way to Swiss Cottage. 'Ah, my friend,' said our informant, 'you passed it three miles back.' 'Oh,' I replied, 'what village is this?' 'This is London,' stammered the bewildered individual. In another ten minutes our hotel was reached, an experience quite different from our entry into Paris via the Champs Elysées. But that is another story.

"One week in London was soon a thing of the past, and we were again on the highway this time bound for Southampton, our steamer, and home. After the usual formalities in New York with the customs officials, we found ourselves once more in the car on the last lap of our trip, with Plainfield but 20 miles away. All went well as it had since landing in France, until we reached the middle of the Holland Tunnel. Here our motor failed, and we were ingloriously towed out on to

Jersey soil in the middle of the night. However, an able mechanic soon located our trouble, first relieving me of a substantial part of my bank balance, which by this time had dwindled considerably. In another half hour we were home, having covered four thousand miles of the most delightful motoring I have ever enjoyed. Take your car when you go again. It is the ideal way to see Europe today and there is still room over there to park the car." — W. MALCOLM CORSE, *Secretary*, 810 18th Street, Washington, D. C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

## 1900

On January 21 we had a very enjoyable evening at the Faculty Room, some 31 members and ladies gathering for a fine dinner, followed by several reels of movies. Patch furnished a projector and ran off his film taken at the Class Reunion last June at Osterville. To see ourselves on the silver screen provided thrill after thrill and recalled the pleasant days of last summer. Charlie Smith looked pretty flashy in his wife's one piece cavorting about the beach preparatory to a plunge and Fitch showed up Bobbie Jones on form in his golf drive. The march in review took in all of us and should result in some very flattering offers from the magnates when the films have their first public presentation.

Fred Lawley furnished a film which showed a mixture of reunion happenings and boat launchings. It was indeed interesting. Patch's next showing was of a trip to the St. Lawrence and the Gaspee Peninsular with a lecture on the fishing industry. Jim knows his fish and was well able to prove it. Another captain of industry and power stepped forward next to describe his film which was of his trip to Mexico in search of the proper place to erect a dam. Allen explained that this was the reason for his being obliged to forego the pleasure of the last reunion. It was a very interesting reel and we are all indebted to E. G. for his thoughtfulness in bringing it in. Taking the evening as a whole, it was voted a big success on this our initial staging of a ladies' night. The following with their better halves attended: Leary, Lawley, Richardson, Fitch, F. N. Conant, Patch, Draper, Sperry, Allen, Bowditch, Cotting, also Wilbur Davis and daughter, Crowell, Brigham, Jackson, Walworth, H. E. Osgood, Graff, and Howe.

The following letter is from Bowditch: "Mrs. Bowditch and I cannot compete with Jim Bacheller in the length of automobile trips but we made one last October which we think was pretty good for us. We drove from Boston to New Orleans and return, a distance of about 3,900 miles in 17 days of driving. The weather was just what we wanted and the coloring in the mountains was very beautiful, especially near Bear Mountain Bridge, the Storm King Highway in New York and Asheville, N. C. We drove leisurely going south, stopping at the Battlefield of Gettysburg and two cotton mills, of which we were stockholders. We spent



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one night at Tuskegee Institute and were very much interested in seeing the work which is being done there in behalf of the Negro. The Dean of the Institute is a Harvard classmate and he asked me to say a few words to the students. I was not at all prepared for this but was able to say something about the Dean, which I hope the students appreciated.

"We were very much impressed with the love of flowers which the southern people showed. In the mill towns there were bright flowers about the houses, and about the small places of the poorest mountain people there were small gardens or flower boxes on the piazzas. Everybody was very polite, and the only time I had to change a tire a Negro offered to do it for me and he did it better than I could. Another Negro brought me some wood for a fire to heat our lunch. The men at the gasoline stations were of great help in picking out the best roads and giving information about places to spend the night.

"We stayed at New Orleans four days to attend a Hospital Convention and I tried to get hold of John Porter, but he was at a meeting. At Atlanta I called up Collier, but he was in Birmingham. On our way home we stopped at the Natural Bridge in Virginia and visited it at night as well as in the daytime. The bridge is lighted at night in such a way as to bring out its most interesting points and is much more impressive than in the daytime."

Again we are called upon to record the passing of one of our old time classmates through notice received from the Wichita Falls (Texas) *Times* of November 12, 1930. "A. V. Moller, 53, operator of one of the largest poultry ranches in the Wichita Valley and widely known as an authority on poultry, died at a hospital here shortly before noon Wednesday after a long illness which followed an operation about a month ago. His poultry ranch stocked with several thousand white leghorns, including many prize winning birds, is situated on the old Grant Street lake road about six miles beyond the city limits." Moller was in Course II while at the Institute.

Patch's son Ralph is now taking a post graduate course in chemical engineering at Technology. Ralph graduated from Amherst in 1927 and taught for three years in the Department of Chemistry at the American University of Beirut where his father was formerly professor of chemistry. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

## 1901

Since writing you last, 1931 has dawned and must be regarded as already in a lusty childhood. The important event of the current year as indicated by all of the important forecasters, soothsayers, and necromancers is the Thirtieth Reunion of the Class of '01. This cannot be news to you as every member of the Class presumably has had a vague premonition of an impending event. A brief statement has already been circulated to you and

will be in your hands long before this communication sees the light of day. It is unnecessary for me then to do more than request the 80% of the Class who have failed to indicate their decision in the matter to hunt up the postcard, fill it out, and send it back. It may be of interest to you in this connection to know that we have a number of men already signed up. We are having a special bed built for Nat Patch as the ordinary couch of commerce fails to accommodate his six and a half feet of pulchritude unless he assume a contour suggesting an accordion or the old-fashioned rail fence. He betrays no enthusiasm for this procedure as it takes two hours and a hot iron in the morning to restore him to a relative linearity.

Word has just reached me of the sudden death of Ralph Plumb. I have no details at present, but will include them in my next letter. In the meantime I wanted to get word to his many friends who unite in deep regret at his untimely demise.

Fred Clapp, the Class stay-at-home, is just back from Texas. He says it is oil, but the contiguity of a group of winter resorts across the Mexican border makes me feel that there are probably other though unnamed urges. — Phil Moore passed through Boston a few days ago and it was my good fortune to have an hour with him. He will sit in at the Reunion and do much to make it a success as he did our earlier gatherings.

Bob Derby has seemingly developed the habit of seasonal visits to our sister continent. He sailed for South America last August, returning at the end of October. I quote him exactly when I state that his arrival in Rio de Janeiro coincided with the opening of an International Beauty Contest which occasioned much excitement throughout Brazil. With a coy reticence Bob does not state the character of his personal participation in the event, but from its reaction upon our unconditioned neighbors below the equator, I assume he was a competitor. He adds later in the letter that the revolution in Brazil occurred a month after he left, so I presume the regret at his departure gathered slowly. As he also missed a row in Argentine by ten days and one in Peru by a longer interval, I fear that his trip was a dull one. Still the Beauty Contest undoubtedly offered some recompense for the loss of these other diversions. Quoting him again, "My first visit to Brazil was in 1910, when I spent eight months there. Again in 1926, I was there for about a month, and this time I stayed for about the same period. From the somewhat primitive city of 21 years ago, Rio de Janeiro has developed into a great metropolis with a 23-story skyscraper and numerous modern business buildings, hotels and apartment houses. The streets are crowded with automobiles. There is a wonderful golf club having one of the sportiest golf courses in the world, the first nine holes being in the hills at the foot of the mountains, and the last nine holes along the Bay. I doubt whether a more beautiful course exists. It is a hard course and I will not mention my score. After a couple weeks in Rio, I spent ten

days in and around São Paulo and Santos, flying from the latter place to Porto Alegre in Southern Brazil. After a week's stay, during which I made a trip into the interior, I flew on to Buenos Aires, then taking the railway over the Andes to Chile, and coming up the West Coast."

Some time ago I got a letter from Bill Freeman (ci-devant Fred) a most interesting communication, the wisdom of publication of which I have long debated. Since the general public, however, has been more or less conditioned by the ballyhoo of Mr. Einstein of Berlin and Los Angeles — in which latter human paradise I understand he has been transformed into a native son — I have less hesitancy in shaking the foundation of scientific tradition on which the intelligentsia of the Class of '01 have been placidly resting. I reserve for myself the editorial privilege of holding myself non responsible for the opinions expressed therein.

"Whether it was from Arlo Bates in Huntington Hall or Tommy Pope in the attic of Walker, we learned that the escutcheon of the genuine should be kept undefiled. But there were inconsistencies in our training even while we were being taught that science would brook no inconsistency. While Professor Talbot on the third floor was instilling into us the principles of Louis Pasteur and insisting that if at any time in the course of qualitative or quantitative analysis the slightest doubt concerning already inscribed data should enter our heads, we should empty our unknown into the sink and begin afresh. On the second floor Charlie Cross was saying in effect that ether had been invented to account for the transmission of light and solar energy from the sun to the earth. Ether was unscientific according to the principles of the third floor. It was expedient and convenient on the second floor. To me it was a blot on the escutcheon of science.

"In 1914 I discovered that light is an emanation of dissociated matter. The discovery came about by reason of a suppressed urge to polish the heraldic emblems that I felt Charles Cross had soiled. No reflection against Professor Cross. As you know the only thing we ever had against him was the back of his collar. He was my first employer after graduation. Professor Norton wanted an assistant and Charlie wished me on him. I was a rotten assistant because I was intrigued by Clunan, the physics department machinist across the hall and spent most of my time there. In spite of this handicap Professor Norton later succeeded Professor Cross as head of the Physics Department. In this capacity he was the recipient of a letter from me asking for information regarding data on possible concurrent discoveries on the nature of light. He referred me to the quantum theory and promised to send me a list of books on the subject. The list never arrived but I delved with scientific assiduity into the quantum theory to no avail.

"I then tackled Henry Fairfield Osborne as broadminded, with a scientific background, and James Harvey Robinson as an intellectual Jack-of-all-Trades.



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After a delightful correspondence with them I gathered that they recommended that I should consult a specialist in physics.

"On the comfortable porch of Rollins '71, at Dover, N. H., I imparted my discovery to Dr. Stratton. Mr. Rollins was wholly innocent of any complicity except in as far as his hospitality may have contributed to my temerity in tackling the Doctor. He tagged me at once as a supporter of the Newtonian corpuscular theory.

"Therein is the crux of the lack of understanding regarding the nature of light. Newton's corpuscular theory was evolved long before dissociation of matter was ever dreamed of. With our present understanding of dissociation Newton's theory becomes the herald of an explanation that only our present knowledge could make plausible. The details I will not annoy you with.

"This letter is to give you the news that you ask for—that the perplexing subject of the nature of light has been solved by a naughty one. Let those who wish to know more about it importune or challenge according to their temperament. I court a challenge."

The above are Bill's words. I call your attention to his concluding sentence. He will attend the Reunion primarily for the purpose of raising those gauntlets which may offer. The Editor bids me close. — ALLAN W. ROWE, *Secretary*, 4 Newbury Street, Boston, Mass.

## 1904

Merton Emerson sent in the following announcement of the death of Marion Dana Rice Stevens: A brief notice was given in last month's Review of Mrs. Stevens' death on January 1. Services were held at the Stevens' home at Chestnut Hill on the following Sunday. Many classmates with their wives were included in the large number present. Charles Stebbins, Humphrey Haley, Edward Parker, and Merton Emerson acted as bearers.

Marion Stevens and her husband, as we all know, were co-secretaries of our Class. No one was more interested in its welfare or more painstaking in seeing to it that all the details of Class management were properly attended to.

In her long illness, as in her life, her thoughts were for the happiness and welfare of others. We, as a Class and as individuals, join in our tribute of affection and esteem to her memory and in sympathy and loyalty to our friend and classmate in his sorrow. — HENRY W. STEVENS, *Secretary*, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, *Assistant Secretary*, 3305 18th Street, N. W., Washington, D. C.

## 1905

A little late, but of course Grove Marcy came through with an account of his European trip last summer. "I had a wonderful three weeks with my young lady daughter. We got a car and driver and covered Switzerland pretty thoroughly, and parts of northern Italy and France. I kept the old Filmo going, and

got some pretty good Kodacolor for a first try. We were ahead of the mob, but some of the passes were open, and the flowers were wonderful as you chased the season right back to winter going up to snow line. I'm going again some time in an old Ford, and take the roads our driver wouldn't risk his big Panhard on. I didn't blame him, as he had to make three tries to get around some of the hair-pin turns. We came back through the battlefields, and I was glad we did, for I had about forgotten there was a hell. It is still hell there, and will be until a new soil forms to cover the splintered rock. It was hard to settle down on returning, so after a few intensive weeks clearing my desk, I took Oliver, my eleven-year-old who is crazy to be a scout, for a week's tramp in the Green Mountains. It was his first experience fighting a pack, but we both had a great time, and both learned a lot, and he came out of it a good hiker and camper.

"Since then I have been attending to business for a change. Of course I get up to the farm week-ends and am waiting to crow over Bob Lord, for I had a big crop of apples, and sold them for what I now admit was a fair price. They are now shipping the fourth and last carload of A grade. Guess I'll have to give the B grade away, but they ran 86½% A grade, and good size, which was pretty good. I'd hate to depend on them for income, however. My son Dick is a Tech sophomore without scholastic glory but full of tales of the night before Field Day, at the present writing. Do you remember the Unfortunate Pig in our time?"

We believe that Arthur Russell has not previously written in. "About two weeks ago (November) I completed 20 years in the government service, all of which with the exception of a year and a half have been with the Navy Department. The first five years after graduation I was with the Bath Iron Works which accounts for the whole 25 years since we left old M. I. T. I think I am one of the few members of Course XIII, graduating with our Class who has stuck to ship building.

At the present time I am supervising draftsman at the Boston Navy Yard where I have been continuously since 1915. Since completing the modernization of the battleships *Florida* and *Utah*, about three years ago, the yard has been mainly engaged in repair work on various naval and coast guard vessels. Based on the report that the department is designing some new cruisers, destroyers, and submarines, the outlook for work in the future is a little brighter than it has been in the past. Keith and Tower had commissions, and were located at the yard during the war, and I have seen them occasionally since. I was very much surprised and pleased to see Frank Payne a few months ago for the first time since graduation. He was at the yard on business in connection with his John Crane packing."

Bill Motter reports the following present at the Tech Banquet in New York in December. Bennett, Charles-

worth, Edmunds, Fouhy, Hool, Keen, Landers, Lombard, and Motter. Edmunds has been in this country for a couple of years developing speed changers for the Crocker Wheeler Electric Manufacturing Company of Ampere, N. J. The speed changers work by the adhesion of hard ground steel surfaces rolling upon each other and pressed together with forces which insure at all times driving without slip. They are said to be quiet and vibrationless, of high efficiency, long wearing and suitable for high speeds. The Crocker Wheeler Company builds them into their motors.

In his book "Little America," Admiral Byrd writes that "the distinguished naval constructor, Captain Gatewood offered to superintend the refitting (of the ships *City of New York* and *Eleanor Bolling*), and . . . rendered us invaluable services." — In the November Review, our copy was edited to make George Thomas Vice-President of the United Shoe Company when we had it "United Shoe" which, of course, means United Shoe Machinery Corporation, the concern that builds about all the machinery that is used in making shoes. — There has been no response to our call for still photographs of the reunion and nobody has sent in a report of Swampscott and the banquet. — The Virginia Smelting Company (Charlie Johnston) sent out a novel Christmas card in the form of a Uniform Straight Bill of Lading covering "1 carload of our very best wishes prepaid."

Elmer Wiggins attended the New Orleans meeting of the American Institute of Chemical Engineers in December. Then he inspected the Spartan airplane factory in Tulsa, Okla. His letter apparently describes some things about airplanes which cannot be decoded. It was probably written in the air on the way home. — Edward Church Smith (there are eight Smiths so we must be precise) is another classmate who has rolled through your Secretary's town without even waving his hand. He was looking up ancestral homesteads near-by in connection with a History of Middlefield, Mass., which he has published. Since his visit to Tucson, where he went two years ago for his health, he has been back with the National Carbon Company, Cleveland, still improving the Eveready battery.

John Glidden reports that the outbreak in Peru a while ago among the native employees of the Cerro de Pasco Company, which resulted in the killing of two Americans and the wounding of several others, did not affect him and his associates at his particular camp, beyond necessitating their withdrawal to Lima for a month's vacation until affairs become quiet again. Glidden's letter, which was written shortly before Christmas, said that they were all back at work again, and he had a feeling that there was no likelihood of another similar outbreak in the near future. Thank you, Professor Locke.

Joe Daniels writes from Seattle that Ted Steel, who was with the Puget Sound Power and Light Company in Bremerton,

1905 Continued

Wash., is now with the Columbia Engineering and Management Corporation, 61 Broadway, New York. He adds: "I do not golf, indoor or out, and except for an occasional hand of bridge or 'terpsichorean tripping' (ain't that good?)—anyone at Oyster Harbors will agree that it was—my hobby is to read and grow fat." In addition to dancing, George Jones indulges in figure skating. There is some advantage in retaining one's youthful figure, Joe. George writes: "Last Sunday morning I tried a little skating out in the country with a friend but we crossed the range of some trap shooters and had to duck down low and skate under a barrage of small shot which we could hear falling in the woods beyond us, thus illustrating another one of the risks of skating. Last year a man with whom I was practicing a waltz step on the ice fell and broke a rib; but shooting is something new."

To date there has been no great demand for the Reunion Film. It may be due to our modesty in saying that its authors were "not particularly proud of it." That wasn't much of a way to sell the idea. The film is very fine. Grove Marcy, who had the first pre-view, wrote "it's a corker." No one should miss this chance to see his school mates in middle age. (That hurts.)—ROSWELL DAVIS, *Secretary*, Wesleyan Station, Middletown, Conn. SIDNEY T. STRICKLAND, *Assistant Secretary*, 20 Newbury Street, Boston, Mass.

## 1907

Walter Bigelow is now doing designing engineering work with Jackson and Moreland, '07, at their Boston office. — John M. Frank has sent a thoughtful note to the Secretary with a memorandum to the effect that he has been elected President of the National Association of Fan Manufacturers, representing 80% of the ventilating fan and blower industry of the United States.

In the Boston *Herald* of December 25, 1930, was the following item: "Miss Elizabeth Sweetser Moller, daughter of Mr. and Mrs. Kenneth Moller of Milton, Mass., was married to Robert Sanderson, son of Judge George A. Sanderson and Mrs. Sanderson of Littleton, Mass., at a simple ceremony in St. Michael's Episcopal Church, Milton, yesterday at noon by the Rev. Vincent Leroy Bennett, rector of the church. Only members of the immediate families attended the ceremony and there were no attendants. A breakfast and reception followed at the home of Mr. and Mrs. Moller. Mr. Sanderson, a student at the Harvard Medical School and his bride will go on a wedding trip during the holidays, returning on January 5. Mr. Sanderson prepared for college at the Groton School and is a Yale alumnus of the Class of 1926. His bride graduated from St. Timothy's school, making her debut during the season of 1927-28. She belongs to the Vincent Club and the Junior League of Boston."

Karl W. Richards organized his own contracting firm on October 1, 1930, K. W. Richards, Inc. His office is at his

home 1151 Great Plain Avenue, Needham, Mass. — The Helena (Mont.) *Independent* of December 26, 1930, had this article regarding our classmate: "Carl J. Trauerman, Butte mining engineer and stock bond broker, was 'the first person in metallurgical history to successfully concentrate pink manganese,' says the *Mining Journal* in an interesting review of the career of the well known head of the Montana Stock and Bond Company."

"One of the most persistent disseminators of Montana news is Carl J. Trauerman," the *Journal* states, and refers to the wide range of information regarding Montana products which is set forth weekly in the Montana National Resources *Bulletin* which is issued by the Montana Stock and Bond Company. Mr. Trauerman established the *Bulletin* in 1924, the paper states. It is now being reprinted in 350 magazines in the United States, Canada, and England and reaches more than 15,000,000 readers, the *Mining Journal* estimates.

"By profession Trauerman is a mining engineer, an alumnus of the Massachusetts Institute of Technology," the article continues. "In 1907 he became associated with the Enterprise Mining Company in New Mexico and operated mines in Arizona, Nevada, and Colorado. In 1912 he established his residence in Butte and assumed the position of consulting engineer for the Butte Central and research company. During his experience he invented with John E. Rothwell, the air lift thickener and made several improvements on drum filters. While the war was in progress he gave valuable service in the production of manganese for use by the government ordnance department."

"The *Mining Journal* refers to the fact that Mr. Trauerman is President of the Butte Radio Club, 'the largest organization of its kind in the United States,' is Secretary-Treasurer of the Montana Alumni Association of the Massachusetts Institute of Technology; is an interesting writer on technical topics of the mining world; is Montana correspondent of the *Wall Street Journal*, of whose mining department he was once manager; is President of the Montana Stock and Bond Company and 'handles only high-grade securities.'"

Professor Masanao Yendo of the Yokohama Technological College received last June the honorary degree of Doctor of Engineering from the Tokio Imperial University, in recognition of his work along mechanical engineering lines. — BRYANT NICHOLS, *Secretary*, 2 Rowe Street, Auburndale, Mass. HAROLD S. WILSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

An interesting bit of news received during the past month came in the form of a very attractive Christmas card from Mr. and Mrs. Reginald L. Jones, in which was enclosed the announcement of the arrival of Peter Babcock Jones on Decem-

ber 20, 1930. R. L.'s family now consists of Elizabeth, five years old; R. L., Jr., four years old, and little Peter.

Maurice R. Scharff was recently elected a member of the American Institute of Consulting Engineers. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. PAUL M. WISWALL, *Assistant Secretary*, General Foods Corporation, 250 Park Avenue, New York, N. Y. MAURICE R. SCHARFF, *Assistant Secretary*, First National Bank Building, Pittsburgh, Pa.

## 1910

Notes are coming in a bit better these days, and it turns out that the gang will write in now and then if given a little encouragement. I hope the good work will keep up. Robert Bayle writes: "Greetings to my old classmates. Am still at the old stand — The Boston Store, Inc., Glens Falls, N. Y., and would be pleased to hear from any of the old bunch." — This from Albert Beach: "Just a few lines in reply to your recent letter. I am still with the New England Telephone and Telegraph Company as outside plant estimate engineer in Boston. While I have frequent contact with other Tech men I seldom meet any from the Class of '10. Please give my regards to any that you may see."

Earl Barber, who has been an engineer in the Department of Public Utilities, writes: "As it happens this letter reaches me while I am packing out of the State House, where I have been for the last ten years to go back again to Washington, D. C. Only this time it is the government of the District and not the Federal Government that is blessed. I am still keeping my place and residence in Reading because I may be gone only for one year."

Joseph Bach, President of the Abel and Bach Company of Milwaukee responds a little more at length: "Replying to your letter regarding the Class of '10, I hardly know what you expect me to write for The Review and a person really hates to talk about himself but I suppose that is what you expect me to do. I am still in the trunk business and have been ever since I left the Institute and wish to advise that business conditions in our line have been hit as hard as any other line during the past six months. We hope, however, to make 1931 a big year with us. I see Lloyd Cooley once in a while up in Milwaukee although he has made his residence in Chicago. Outside of that I have not seen any of the '10 men.'"

Professor Jack Babcock contributes the following: "I received your 'call for news' some time ago but delayed answering it as I was in the midst of remodeling a house. Recently I made a swap of houses, giving up a small six-room house which we had outgrown and took over a twelve-room house built about 30 years ago. This necessitated a large amount of remodeling, bringing the equipment up to 1930 standards and making many changes so that the new home would have the room arrangements which we had long desired. As I had been instructing the coming generation of engineers in the art



1910 Continued

of construction and estimating, it seemed a good chance to try out these principles at my own risk and expense. For the past few weeks I have been busily engaged in keeping track of plumbers, carpenters, masons, paper hangers, tile setters, electricians, and so on, and attempting to keep up my regular duties at the same time. This will explain my delay in writing you a few lines. We expect to move in about February 1, after which my home address will be 21 Orient Avenue, Newton Center, Mass."

John M. Bierer, factory manager of the Boston Woven Hose and Rubber Company, spoke on January 14 at a meeting of the Technology Chemical Society. His talk, which was on "Rubber—its Properties and Manufacture," was illustrated with lantern slides. He also had a large number of exhibits including crude rubber, latex, compounding agents, and many finished products.

Ludwig Waters recently broke into print in the *Hartford Times*, and we are quoting extracts as follows: "The election of Lewis W. Waters to a vice-presidency of General Foods Corporation, in charge of research and development, brings to public attention a man long prominent in the food trade and emphasizes the importance of research in a business that provides nearly 25% of our national income. . . . The passage of the pure food laws gave Mr. Waters his start in the food industry. After working with Professor A. G. Woodman at M. I. T. he joined the chemical department of Campbell's Soup in 1911, returned to Technology as assistant to Professor W. T. Sedgwick, in charge of biology and public health, and then he went to the United Fruit Company in charge of their research laboratory for tropical fruits." — DUDLEY CLAPP, *Secretary*, 40 Water Street, East Cambridge, Mass.

## 1911

Already encouraging reports are coming in to Oswald W. Stewart, Reunion Chairman, from the regional chairmen concerning attendance at Dennie's Douglas Inn the last week-end in June and it's a certainty that there will be a lot of wives and children present, which adds to the gaiety of the affair. Don't be a stay-at-home!

Once again the power of '11 was shown at the Class Dinner held at Walker Memorial on January 16 for, believe it or not, there were exactly eleven men present, to wit: Ernest Batty, Bog Bogdasarian, Obie Clark, Marshall Comstock, George Cumings, Dennie, Jack, Charlie McManus, Fat Merrill, Ted Parker, and O. W. Stewart. There was the usual reminiscing during one of Bert Bridges's characteristically fine meals, and the coming reunion came in for discussion resulting in the submission of several valuable suggestions for O. W.'s committee.

After a while we adjourned to the bowling alleys and split up into two teams, captained by the business partners, Batty and Clark. Batty's battlers, after losing the first string to Clark's conquerors, proceeded to win the next two strings

and the match 3 to 1. Charlie McManus and Jack Herlihy tied for the high single string, 88, and Charlie won the high three string total with 259.

Ted Van Tassel was in Boston January 12-14 at the Shoe Show, but unfortunately could not stay around the extra two days and take in the Class Dinner. Another usual attendant, Roy MacPherson, had to be in New York at that time, so could not attend. — When the Massachusetts Coaches' Association met in Cambridge last month, Charlie Linehan, I, was reelected Secretary. You know he teaches math. and guides the athletic destinies of the Browne and Nichols School in Boston. — How time flies! Recently two classmates — Bill Orchard of Newark, N. J., and Hal Robinson of Worcester — reminded me that they each had sons entering college this fall. How many others are in this category?

Your scribe was laid up for about three weeks following Christmas as a result of being knocked over by an auto on the State highway in Wells, Maine, sustaining contusion of the right thigh and hip. Fortunately it was a painful but not lasting injury. Up and at 'em! — Douglas Hill is glorious on this late January day, although the two-foot blanket of snow is a decided contrast to the green verdure of the land in late June, when you all will either be here or wishing you were — specifically, June 26-29, Twenty-Year Reunion at Dennie's Douglas Inn, Douglas Hill, Maine. Let's go up to Dennie's place! — ORVILLE B. DENISON, *Secretary*, Douglas Inn, Douglas Hill, Maine. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

Albert C. Albee, I, has come through with the kind of letter we like to get. "It won't be long before we have our Class Reunion," he writes. "I hope that I will be in a location near the place. A year ago last July I went to work for the Erie Railroad and am still with them. They are seriously contemplating moving to Cleveland in the near future. I have compiled tables of weights and truss and girder highway and railroad bridges so that it does not take long to make an estimate. Have estimated about \$30,000,000 with this firm and about \$40,000,000 with other contractors. Last summer Doc Sloan made me a short visit. He went to the Technology Club of New York City but did not see anyone. On his Christmas card he said he had purchased an electrical welding outfit, having had a desire to go into this business for some time. I am writing a book on estimating buildings, and it is the result of accumulating data for 19 years on construction work. It will have data in it no estimating book I have ever seen has, and I have six estimating handbooks. A few days ago I wrote McGraw-Hill Book Company, Inc., about publishing it, and got a nice letter from the Associate Editor in which he stated that they might be interested. It will be some time before I get all my data compiled." Albee resides at 12 Marion Terrace, Maplewood, N. J.

Due to the lack of news this month, your Secretary will give a brief sketch of a trip taken last summer on a friend's schooner to Nova Scotia and Prince Edward Island. Leaving Marblehead on the first of July, Mrs. Shepard and myself with the skipper and his wife struck across the Gulf of Maine direct for Halifax. We were in fog for three days but picked up the fog signal below Halifax on Friday afternoon and dropped anchor Saturday morning in the lee of the Royal Nova Scotia Yacht Squadron breakwater. It certainly was good to get ashore and we made arrangements that afternoon for an automobile trip through the Annapolis Valley to Digby, a distance of about 90 miles.

After three days in Halifax, we started east again, making Canso in about 24 hours. After a day's stop here, we struck across to Cape Breton, and going through St. Peter Canal, sailed up the Bras D'or Lake to Baddeck. Here we tried salmon fishing one day, and trout fishing the next, with not much success as we landed only one fair-sized fish. We took the steamer from there up to Sidney as the tidal currents are very strong through the narrow outlet and we also wanted the automobile drive back to Baddeck. While at Sidney we visited Louisburg and walked over the ruins of the old citadel which was twice captured by New England troops.

Returning to Baddeck, we sailed back through the lakes and through the Gut of Canso to Pictou, and after a while here, sailed across to Charlottetown, Prince Edward Island. We spent an interesting day in visiting fox farms, as this is the center of this industry. After returning to Halifax we stopped at Lunenburg, Shelburne, Bar Harbor, Boothbay, making Marblehead the first week in August having covered something over 1,800 miles by water. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. MCGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 10th Avenue and 36th Street, New York, N. Y.

## 1913

Once in a while the daily news carries headlines featuring some member of the Class. The Sunday edition of the *New York Times*, some time ago, showed the architect's drawing for a new building in New York. Closer inspection revealed that many unique features were to be incorporated in the construction. Particular emphasis was laid on the flat wall or shadowless sidewall design. The article gave the credit to Ken Franzheim as architect-in-chief, who it was stated will occupy one of the penthouse office suites. (Franzheim does not deserve all this for he is one of the many Class backsliders when it comes to Class affairs.)

Walter Whitehead, after travels all over the globe in the interest of geology, is making a protracted stay around Boston. Just at present he is a special lecturer on petroleum geology at the Institute. No doubt, when summer arrives he will be off to Australia, South America, or



1913 Continued

even South Africa pursuing his job as a consulting geologist. — St. Louis claims Benjamin F. Thomas, Jr., as a consulting engineer. He states that "building up an engineering business along with three children is enough of a hobby for any man."

Relative to the new Boston Post Office, we note that C. F. Haglin and Sons Company of Minneapolis were one of the bidders for the new structure. This is the concern of which Charlie Haglin is a Vice-President. Too bad they did not get the bid, for it might have brought C. F. to Boston and then we might have had some real news. A wife and two daughters keep him busy, outside of business hours. — A report comes in that Hap Peck is President of the Sharon Parent-Teachers Association. Apparently Hap was jealous of Jim Russell and his connections in Milton. Now his troubles have started.

They say a certain place is paved with good intentions. George Leavitt made a firm resolve nearly a year ago to write in some real news for *The Review* and to do it regularly, but alas! As plant engineer for the Southern Cotton Oil Company he spends his time at Bayonne, N. J. and lives at Cranford. Perhaps the family including four children gives him but little idle time for Class Notes. Maybe this will wake him up. — Heinie Thompson is an aviation engineer with Westinghouse in Pittsburgh. He used to be an electrical engineer, but apparently aviation has claimed him. Perhaps he will tell us about his job.

A brief word comes from Paul Cogan that he is in the sales department of the Bethlehem Steel Company at Bethlehem, Pa. It must be rather hard on him to be so far from the ocean and no chance to fool around with yachts. He still enjoys bachelorhood. — Harry E. Prentice is manager of the Prentice Company of Taftville, Conn. Being the father of four children is the only personal information we have been able to obtain. — Charlie Hopkins has located away out in California. Balboa is his home and Los Angeles his place of business. He is President of the United Constructors, Ltd., and belongs to more clubs and societies than can be conveniently mentioned in this small space. No mention was made of the California climate.

One classmate was left out of the Washington group mentioned last month. He is R. M. Wilson and is connected with the U. S. Geological Survey as a topographical engineer. He is married and has a son and lives on 16th Street in Washington. — From New York we learn that P. Leroy Flansberg is one of the '13 group who is in the telephone game. Flansberg is with the New York Telephone Company as an estimating engineer. Reports indicate that his garden at Compton Plains takes much of his time.

Not a single letter or 'phone call has come into your Secretary's office since early in the fall. Since golf and gardens cannot take your time at this season of the year, drop us a card or letter and give us some fodder for the news. — GEORGE

P. CAPEN, *Secretary*, 50 Beaumont Street, Canton, Mass. ARTHUR L. TOWNSEND, *Assistant Secretary*, Room 3-435, M. I. T., Cambridge, Mass.

## 1914

The third luncheon of our winter series at Boston was held January 7 at the Engineers Club. Ted Gazarian presented, in a most effective and interesting manner, the story of sausage making. While somewhat removed from our usual engineering contacts, the talk portrayed clearly the extension of engineering into almost every part of our daily existence. Those attending the luncheon were Ahern, Crocker, Gazarian, Stump, Wilkins, Trufant, Fales, and Richmond.

On leaving the club we heard much moaning coming from the barber shop. Investigation showed the source to be none other than Gardner Derry. We had read of plastic surgery but had never seen any in process before. There was Derry with all appearance of being made over. Surely there was a reason. Yes, he was hurrying to leave for Europe and was trying to look like a Frenchman so as to greet Lester Forbes in Paris without disgracing him. Derry sailed January 13 on the North German Lloyd Liner *Europa* for a visit to Hamburg, Berlin, Paris, and London, in the interests of the B. F. Sturtevant Company, of which organization he is Manager of the Power Apparatus Department.

Your Secretary had the pleasure of calls from two classmates during January, Walter Houston, and Roy Parsell. As his office is but a short walk from the new Technology buildings in Cambridge, your Secretary would appreciate having any out-of-town '14 men visiting Technology drop in for a chat. Walter Houston has been with the New England Power Company in the Fifteen Miles Falls Project which Corney described to us at the December luncheon. This work is now completed and Walter is ready for the next construction opportunity that develops.

Although Parsell was on engineering work for the Mohawk Carpet Mills up in New York State he did not give up the home he has on Long Island Sound near New Haven, and is now back there. Roy looked in the best of health which he attributed to his golf and skating activities. He said that experience is gradually teaching him the necessity of spending the time between reunions training, so as to survive the next one.

Our honorary member, William Jackson, recently sent a pension agent around to see your Secretary. The full significance of this has not fully developed, and we will call for a complete explanation from William himself at our next dinner.

A check-up on the morning of January 1 showed that local '14 men still retained their endurance abilities. — HAROLD B. RICHMOND, *Secretary*, 30 Swan Road, Winchester, Mass. GEORGE K. PERLEY, *Assistant Secretary*, 21 Vista Way, Port Washington, Long Island, N. Y.

## 1915

Without the help of my classmates, it is becoming increasingly difficult to maintain our unbroken record of a column of notes in every issue. So you'll have to write in something. We shall probably have the long deferred Boston and New York Class Dinner in February so that the April issue will bring you some news of those two interesting events. Meantime, help! help! — AZEL W. MACK, *Secretary*, 379 Marlboro Street, Boston, Mass.

## 1916

It was recently my great pleasure to receive some class news unsolicited from one of our members. I only wish that more of the boys would take it upon themselves to drop me a line now and then. This particular occasion was a good long letter from Rudolf Gruber. As Vice-President of Merck & Company, Inc., he has been placed in charge of the newly formed new products division with headquarters in the New York Office. His letter follows: "In spite of the fact that I am a regular reader of the Class of '16 personal news columns of *The Technology Review*, I believe that I am no better than some of my classmates as regards overcoming inertia and sending some personal news to the harassed and hopeful Class Secretary. You may be interested to know what a Director of a New Products Department is supposed to do. Well, here it is: there are suggestions for new products constantly arising, both within and without the organization. It is essential that the determination as to whether or not these products are desirable to adopt for manufacture or marketing be adequately and quickly handled under a centralized head. To the New Products Department are referred all suggestions for new products, in order that the merits of the suggestion may be examined from all necessary angles. This is accomplished by the consultation of various specialists in the chemical, medicinal, legal, and sales field. As you may imagine, this simple formula covers a rather extensive field of activities, which is not confined to this country, but extends to European firms.

"One of the bright aspects of my present work is the fact that it has brought me in frequent contact with various members of the staff of the M. I. T., in connection with consultation and experimental work. If anybody has any particularly bright ideas which lend themselves to development by manufacturers of drugs and chemicals, I hope they will let me know about them, and I will be glad to turn my microscope on the problem. I am glad to hear about plans for a Class Reunion, and only hope that this time I will not be abroad on that date, as has been my misfortune during the last two reunions."

Jeff Gfroerer recently sent me two interesting photographs of his wanderings around Germany, in particular of Bachrach on the Rhine, and Rottenbreck, Bavaria. Jeff says: "It hardly seems possible that 11 months have slipped by

## 1916 Continued

since I left the United States. We have been working extremely hard this past year and are pleased to say that our company has shown a profit for the year, which is very good considering. From what you say of your golf, we should get together. Last Saturday afternoon my first nine holes were 53, and fortunately it rained when we were shooting the 13th so we had to stop. My one ambition now is to get down to 100. I started in playing night tennis at our indoor court Wednesday evening, which should keep me in shape for the winter. Had lunch in old Heidelberg yesterday at a delightful hotel overlooking the old castle and the picturesque Neckar River. No, Henry, there are darn few really attractive girls in this country and they haven't the money to make themselves look as nice as the girls do at home. Of course, they do not trouble me too much anyway. Surely wish I could be back for the Reunion with you next spring."

Clinton Carpenter is President of Carpenter & Petrie, Inc., Contracting Engineers, located at Norfolk, Va. Clinton writes: "It was a pleasure to hear from you and to be reminded of the Reunion next spring. I fully expect to be there and will be interested to learn where it will be held. I certainly enjoyed the time we had last June. — So far as business is concerned we have fortunately kept as great a volume on hand this year as in any since we began in 1921 though profits have been smaller as a result of the general economic conditions. Things are a little slack right now, however, and our operations are confined to one job in North Carolina and one here in Virginia. Prospects look pretty good for a considerable volume of work to come out in the next few months. — My little daughter Sylvia, will be four next August. Naturally during the Christmas season her main interest was in Santa Claus and she has it all figured out. As a matter of fact, with her reasoning ability and her powers of deduction I think she would make a wonderful engineer."

Our good classmate, Robert Wilson, has recently been placed in charge of all the research work of the Standard Oil Company of Indiana, without, however, relinquishing his other various duties. I am sure we can count on seeing him at the Reunion next June. — As usual I received a most attractive Christmas card from Irving McDaniel '17. The "central motif" was a Chinese junk with beautiful purple mountains in the background. Most of the lettering is in Chinese, which I assume means Merry Christmas. Irving still seems to be wandering around the Far East but says that he hopes to be back in this part of the world next summer.

Tom Holden gives the following brief account of his activities: "Latest news of the Holden family is arrived, by adoption of Clay Stratton Holden, last June. He is now 21 months and 21 days old, husky as Gene Tunney, has never yet waked his family in the night, and owns the entire place and family. Will be ready for Technology or maybe Dartmouth, or to join

the Navy, see the world and get tattooed all over with mermaids, about 16 years from now."

Edward R. Hall has left Baltimore and is now located in Fort Wayne, Ind., care of Western Gas Construction Company. — Henry W. Hastings is in the investment business and is located with the Tucker-Hunter-Dulin Company in Portland, Ore. — Joe Barker has left Bethlehem and is now with the School of Engineering at Columbia University, New York City.

The Reunion Committee have been successful in arranging for facilities at a most attractive and convenient location in Connecticut. By the time you read these notes you will have doubtless already received official notification from Steve Brophy. Reservations are already starting to come in, so take the time right now to let me know if you are going to be among those present as well. — HENRY B. SHEPARD, *Secretary*, 269 Highland Street, West Newton, Mass. CHARLES W. LOOMIS, *Assistant Secretary*, 7338 Woodward Avenue, Detroit, Mich.

## 1917

Here is an abstract from the Providence Evening *Bulletin* of January 10. Yachtsmen may obtain copies of the original by sending seven and three-eighths cents in stamps to the Editors of The Review. It bears the interesting caption: "Narragansett Yacht Fittings Does World-Wide Business," and is followed by: "Walter C. Wood, better known to his yachting friends as Jack Wood, runs the place, a place already known from coast to coast, and which bids fair to make Providence more famous. Mr. Wood doesn't describe his shop as a boat fittings factory, which it really is, but modestly alludes to it as his laboratory where he admits to trying out schemes which will make the amateur sailor man's life easier and more pleasurable. There is no other place like it in Rhode Island. No attempt is made, here, to furnish fittings for larger yachts. The aim is for the benefit of the smaller boats. Mr. Wood plans to make the conveniences in boat fittings which will prevent delays in getting under way, and which will aid the skipper, when he is short-handed, to handle his boat with the least effort and the greatest satisfaction.

"There are so many of these contrivances that space will permit mention of but a few. First comes a self cleating winch with which the yachtsman with a few turns of the handle, may hoist his sail without other help, even under difficult conditions. Among the more convenient fandangoes for a racing boat are the Rhody sail slide magazines. These devices transfer the tedious task of bending sail on small yachts into a remarkably simple and brief operation. A device for the reefing of a sail by rolling it on the boom, as a curtain is rolled, is a novelty for this section. The enthusiast in boating will find much interest in examining sliding goosenecks, stem fittings, turnbuckles, sail out hauls, whisker pole fittings, adjustable mast steps, adjustable jib leads, spreader and mast fittings, jam

cleats, snatch blocks and fairleads, jib sheet blocks, and a hundred other nautical knickknacks which make for easy handling and safety in boating. Mr. Wood finds that interest in the smaller pleasure boats is developing all along the bay, and calls for fittings are increasing. Many requests are coming from Central American ports."

Mrs. William H. Potter of 5 Chestnut Street, Beacon Hill, is announcing the engagement of her daughter, Miss Mary Potter, to Edward Pearson Warner, of New York, son of the late Robert L. Warner and Anne Pearson Warner. Miss Potter was graduated from the Winsor School and attended Vassar College. She is a member of the Junior League. Mr. Warner was professor at the Institute when he was appointed Assistant Secretary of the Navy for Aeronautics under the Coolidge administration. — Walter F. Pond, State Geologist of Tennessee has been elected President of the Engineering Association of Nashville for 1931.

The *China Weekly Review*, Shanghai, China, has much to say about Hsi C. Wang, engineer and business executive, graduate of Tsing Hua College, Peking and later with one of the most famous classes of Technology. Wang has advanced from instructor in the Tsing Hua College to various important positions. He was chairman of a committee for taking over and organizing Yu Tung Shipping Company of which he was later general manager. He then assisted in taking over ships, wharves, and docks belonging to the Eastern Railway, becoming managing director of the North-Eastern Shipping Syndicate and chief of the General Affairs Department of the (old) China National Aviation Corporation. We are now informed that he has been made business manager and secretary of the board of directors of the reorganized corporation. Letters to him should be addressed care of the China National Aviation Corporation, 3 Canton Road, Shanghai.

Neal Turtellotte reports that there was no depression last year as far as he was concerned. He has done as much business as ever. We assume that this is because all the linoleum in Seattle has been wearing out lately. We expect him in the East in the spring for a testimonial dinner. — RAYMOND S. STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass.

## 1918

During the Christmas holidays your Secretary did a bit of traveling which took him to Detroit as the Technology Staff delegate to the National Student-Faculty Conference. No one who has not had such an experience can quite appreciate the wide divergences which exist between the colleges of the United States. On the way home we stopped off at New York and attended the Class luncheon at Enrico's, 66 West 11th Street. The location is half way between the extremes of Times Square and the Battery so that all the boys have an equal chance to get back to the office before the boss misses them. And such a feed! For \$1.00 Enrico serves enough to feed a football team. Rowe,



## 1918 Continued

Taverner, Harrall, Larner, Foster, and Wiley (anchor man on our tug-of-war team) were there. Larner won the spaghetti eating contest by three chapters of Mrs. Price Post; Wiley admitted to a rather new son; Foster is helping out the depression by building a new house on which 30, yes that's what he said, 30 men are working. Taverner has some sort of connection with a dairy — keeping the cows contented, we think.

The January luncheon of the Boston crowd degenerated into a discussion of the relative absolute in educational theory, the explanation of which is unbecoming here. When the appointments for the personnel of the committees to serve the Society of Motion Picture Engineers for 1931 was announced, the chairman of the Division on Standards was none other than our own adopted Professor Arthur C. Hardy.

Harry Camp decided that the insuring of human lives was not so much to his liking as the insuring of good church and movie house music, so he renounced his first love to become sales manager of the Frazee Organ Company. Just to prove that he believes in his product, he has a pipe organ in his house at 28 Highland Street, Reading, Mass., that is worth more than the house itself. The first few times that he played on it the neighbors three houses away thought that he had put in a 50-kilowatt loud speaker. — F. ALEXANDER MAGOUN, *Secretary*, Room 5-328, M. I. T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, 51 Houston Avenue, Milton, Mass.

## 1919

An Alumni seminar on electrical engineering was held at the Technology Club in New York City on January 12. Professor D. C. Jackson spoke on the organization of Course VI, Professor M. C. Brush spoke on the research work being done in connection with Course VI, and Professor E. L. Bowles spoke on electrical communication. '19 men from Course VI were well represented, the following men being present: Karl Rogers, George Patterson, Tom Lloyd, Don Way, and Freddie Given. The seminar was quite a success, and is shortly to be repeated in other branches of engineering.

Gene Smoley, who is standing on his head in the Dutch East Indies, has not been so badly affected by his position as to forget the Class of '19 who are working upright. We received a card from him, and he would like very much to hear from his friends in the Class. — We have another advice from the other side of the earth, that Nobuo Yamamoto of our Class is now managing director of the Sumitomo Fertilizer Manufacture, Ltd., at Osaka, Japan.

Returning to New York, the '19 men in this district had a very nice dinner at the Technology Club on November 19, the following men being present: Louis Brown, Albert Reynolds, Erv Kenison, Karl Rogers, Ralph Gilbert, Loe Kelly, George McCarten, Tom Lloyd, Dusty Rhodes, Fred Rasmussen, Freddie Given,

Bill Basset, Don Way, and Bill Langille. We were very much pleased to have with us for the first time, Louis Brown and Bill Bassett. Brown is a member of the firm of Pruitt and Brown, architects, specializing in restaurant interiors. Many of the interiors in Childs Restaurants and in other chain restaurants are the work of this firm. Bill Basset is now technical director of the Anaconda Wire and Cable Company at Hastings-on-the-Hudson, N. Y.

We learned that David Lundquist is located on the Board of Inspection and Survey in Washington, and for a year or so has been checking up on the acceptance test data for new government cruisers. — Our Class has not been assessed for any dues since 1925. In the meantime numerous small demands on the Class funds have depleted them until it seems desirable to build up the funds so as to be able to meet such demands as contributions to the Alumni Athletic Fund and so on. By the time you received this Review you will undoubtedly have received a notice and bill for \$2.50 for Class dues. Returns for bills sent out to date have been very encouraging.

We would be especially pleased to have you advise us of any change in address so that we can keep our records up to date. — We had a letter from Paul Sheeline. Bill Snow dropped in to see him some time ago, just to say hello. We learned that Bill was recently married and is now established on Beacon Hill. — Tom Lloyd is back with the Fox Hearst Corporation in New York City. — Announcement has recently reached us of the marriage of Bella Slotnik to George Michelson on Tuesday, December 9, 1930, at Brookline, Mass. — WILFRED O. LANGILLE, *Secretary*, 7 Willow Street, Cranford, N. J.

## 1920

Your Secretary was pleased to get the following news of Bob Bradley. Bob has a daughter Brenda Earle Bradley born last August 26. Bob has left the Atwell Company and has become President of the L-H-D Spring Corporation, makers of hair and mainsprings, located at 24 Pine Street, Waltham.

I caught a glimpse of Bud Cofren on the street the other day and stopped him long enough to learn that he is now doing business in Boston. Bud is connected with the National Cash Register Company.

To readers of the society columns it will be unnecessary for me to call attention to the important engagement of Philip S. Rust to Miss Eleanor F. du Pont, daughter of the chairman of the board of directors of the du Pont Company, a graduate of the Baldwin School at Bryn Mawr and an active member of the Junior League.

Rust is connected with the Viscose Company at Marcus Hook and is a member of the Wilmington Country Club and the Wilmington Symphony Orchestra. — HAROLD BUGBEE, *Secretary*, 9 Chandler Road, West Medford, Mass.

## 1921

W. B. Plummer, X, is in the research department of the Standard Oil Company of Indiana and is located at Whiting. Bill is specializing on certain phases of the cracking process. — S. M. Silverstein, X, X-A, is now with Ray at the Rogers Paper Manufacturing Company of South Manchester, Conn., where Saul is technical director. Lee Marvin Silverstein, X-B, X-C, X-D, and X-E, Class of 1951, is ten months old as we go to press. Our genial Sec also writes that he often sees C. C. Stewart, X, who is a special sales engineer with his own offices (Ray's secretary spelled this "officers" but we can't believe these chemists support "the force" these days — Asec) at 8 Beacon Street, Boston. This is called "temperature headquarters" as Chet is the representative for the C. J. Tagliabue Manufacturing Company, makers of temperature measuring equipment. Chet and Leo Pelkus, X, who is general manager of the Barnstead Still and Sterilizer Company (look out for those officers!) of Jamaica Plain, Mass., are close buddies as they naturally would be, both being bachelors and having mutual social interests. Chet says that L. H. Burnham, II, is working on new developments on rubber boots for the Hood Rubber Company, Watertown, Mass., where Larry is manager of the molded foot-wear division.

A belated announcement has just reached us regarding the marriage of Albert J. Hanley, X, and Miss Marguerite M. Connolly of Arlington, Mass. The bride is a graduate of Marycliff Academy, Arlington Heights, and Miss Michaud's School, Boston, and has studied at McGill University, Montreal, and at the New England Conservatory of Music. After graduation Al received a degree from New York University for graduate work and then was a professor for five years at Mount Saint Mary's College, Emmitsburg, Md. He is now a chemical engineer for a firm in Providence, R. I., where he and his bride are making their home. — Only a few months from now and 1921 will be celebrating its Tenth Reunion — a further announcement will be in the mails soon.

A letter from R. W. Smith, XII, at last! Dick and the Mrs. are now at home at 41 Willow Avenue, N. E., Peachtree Hills, Atlanta, Ga. Dick went to Georgia in 1926 to examine the clay deposits for the State Geological Survey and is still continuing the study. As recorded in these columns he published a 480-page report on the Kaolins during 1929. He writes that he is now working on the shales and brick clays and, having made ceramic tests on about 125 samples, is writing another report on them.

Two members of the Class are joint authors of as many articles which have appeared recently. *Metal Progress* for December, 1930, contains an article by V. O. Homerberg, X, and J. P. Walsted entitled "Wear Resistance of Nitrided Nitralloy." — R. D. Booth, '20, and O. G. C. Dahl, VI, presented Part I of "Power System



1921 Continued

Stability, a Non-Mathematical Review," in the December, 1930, issue of the *General Electric Review*. Ralph Booth is Jackson and Moreland's resident engineer at Hoboken, N. J., on the Delaware, Lackawanna and Western electrification (deep salaams to Bugbee Sahib). He has done a good job — though personally we wish he would let a few more little watts dissipate and disport in the cars so that Phoebe Snow and the rest of us won't catch cold!

Our heartfelt sympathy is extended to F. S. Dellenbaugh, Jr., VI, on the recent death of his mother. — Ray writes that he spent some time with P. H. Rutherford, VI-A in Dayton, Ohio, where Paul is a special engineer with the Delco Products Corporation, the fractional horsepower motor and shock absorber manufacturing division of General Motors. Paul's work includes technical sales work in addition to engineering duties. He is married and has a charming little daughter. — RAYMOND A. ST. LAURENT, Secretary, Rogers Paper Manufacturing Company, South Manchester, Conn. CAROLE A. CLARKE, Assistant Secretary, Bell Telephone Laboratories, Inc., 463 West Street, New York, N. Y.

## 1923

Just after Pete Pennypacker, at the request of the New York Club, had been duly installed as Assistant Secretary, another volunteer appeared, Dr. John W. W. Sullivan, formerly of Dorchester, Mass., and now research engineer for the A. O. Smith Corporation of Milwaukee, Wis., manufacturers of steel products. He is to act, however, as a corresponding secretary and report doings of '23 men he may come in contact with in that part of the country. This is promising, as notes from the mid-west have been conspicuous by their absence.

There is a note regarding E. R. Richards in the January issue. Further details indicate that his job with the Monterrey Steel Company of Mexico is that of Open Hearth Superintendent. — From Denver, Colo., come several items: Ben F. Powell is now in Denver after spending a year in Haiti. During the two previous years he was chief engineer for the Border Commission of the Liberian Government in Africa. He was engaged in establishing the border line of the nation through the dense jungle between Liberia and French Guinea. Tropical life seems to agree with Ben and he is planning on a return trip. Douglas R. Waterman is now in Denver working for the Hendrie and Boltoff Manufacturing and Supply Company. He is the proud father of two young sons. His address is 528 Humboldt Street, Denver.

Information received by the rather devious route of a clipping from the York (Pa.) *Gazette and Daily*, quoted by the Derry (N. H.) *News*, tells us of the marriage of Leo H. Poor, with Jim Robbins as best man. He married Mary Margaret Stoops of York, a graduate of Columbia University. Leo is in the freight transportation department of the Pennsylvania Railroad at Baltimore. His bride had been

teaching home economics at Middlebury, Vt. — The engagement of John L. Brill to Miss Martha J. Fenn of Wilmington, Del., has been announced, with the wedding scheduled for the spring. Miss Fenn is prominent socially in Wilmington. Brill, now located in New York, lived in Wilmington for three years and has just returned from a year abroad as a representative of the du Pont Company. — The New York *Herald Tribune* reports that Tommy Rounds is to marry Miss Marjorie A. Land of Riverdale, N. Y. Miss Land is a graduate of Skidmore College. The engagement was announced in November but I have no information as to the date set for the wedding.

Among address changes which imply some change of major importance to those involved are the following: Cecil H. Green from California to Dallas, Texas; Donald W. Height from Melrose, Mass., to Mt. Vernon, N. Y.; Edwin M. Barnes from Ridgeway, Pa., to Greenwich, Conn.; Charles E. Mongan from Zurich, Switzerland, to Somerville, Mass., and Walter Munford from Worcester, Mass., to Cleveland, Ohio. — Some of the new addresses indicate new connections. Here they are: Fred H. Travers, General Electric Company at Bridgeport, Conn.; Edward F. McSweeney, Jr., Blaker Advertising Agency, New York City; Willoughby D. Gundry, the Port Isabel Bridge Company at Brownsville, Texas, and Earle A. Griswold, Zonite Products Company, New York City.

Following we present Pete Pennypacker's notes about the New York Club. — The New York Club of 1923 started the New Year with a bang by holding a Monte Carlo night on January 8 at the Technology Club. The 17 following men were present: Ken Andem, Jim Brackett, Waldo Fox, Johnny Frank, Rod Goetchius, R. H. Henderson, Nick Kane, Dave Kaufman, Harry Kent, Charlie Mapes, Walt Marder, Pete Pennypacker, Al Pyle, Isadore Robinson, John Sands, F. P. Squibb, and Lem Tremaine.

Seven fellows had dinner together ahead of the party and there was plenty of fun and reminiscence around the table. At 7:30 the regular program began and bets ran high (higher and higher, in fact) until 10 o'clock. The way money changed hands was a caution! In order to announce the event Squibby had prepared a comprehensive and interesting circular, pointing out the aims and policy of the New York Club of 1923 for the coming year and giving out the specific information regarding the Monte Carlo night. He announced that Charlie Mapes would be the Pousi for the evening. No one knew what Pousi meant until they arrived. Then they learned that Pousi and bone-roller meant the same thing.

Charlie proved to be so clever with the bones that he soon broke all the opposition and ended by playing solitaire with the cubes. Not content with winning from the other crap-shooters, he proceeded to beat himself at Crap-solitaire, for which he was awarded third prize, a pair of white satin suspenders.

Walt Marder came with a game all his own. He built himself a squirrel cage inside of which were three trained dice. So well were they trained that they inveigled Johnny Frank to put down 24 packs of ten one-thousand dollar bills each, making a total of \$240,000 (in Soviet currency, I believe) on the wrong number! Walt ended second highest man for the evening and received a game of backgammon for his efforts. Waldo Fox proved true to his name, demonstrating that he was the most foxy poker player of all. We wonder where he gets his experience in accumulating royal flushes and wearing poker faces. It didn't seem to hurt him at all to take in the stakes from the rest of us who were poor and so consistently did he vary his game that he ended the evening as high man and was awarded a very desirable pen and pencil set.

The money from the treasury was sold at an exchange value of one dollar per thousand and a quarter per each additional thousand, so that in spite of high betting no one lost more than a very nominal amount and all shared the net profit of a very enjoyable evening.

It is reported that Miles Pennypacker is now located near New York. At the Reunion last summer he reported that he was working in Boston promoting the use of neon signs. — Robert V. Burns has traveled from New Jersey to the State of Washington where he has taken a position on a bridge construction job for Stone and Webster. He was formerly with the Edison Company in West Orange, having charge of radio assembly there. Last year Bobbie was the star performer of the '23-'24-'25 dance, and the New York Club will miss his presence at the party this year to be held, according to plans as this is written, on February 14.

Nicholas Cohen has changed his last name to Kane and wishes all classmates to be so informed. When I asked Nick what he was doing, he replied, "The City of New York." He is employed by the city in evaluation work. I asked him further why he took up this position and his answer was to the effect that it was the only one he knew of which gave a month's vacation every year. — Harry Kent is living in Stamford, Conn. He is associated with the National Electric Light Association in New York. He informs me that William E. Appleton, also of VI-A, is associated with the New York and Queens Electric Light and Power Company. It's funny how those electricals go around throwing light on each other!

Johnny Sands is a metallurgist with the International Nickel Company of Bayonne, N. J. — Ken Andem is an assistant engineer with the Public Service Production Company of Newark, N. J. He lives in Union, N. J., which Walt Marder says is a suburb of Plainfield. As a matter of fact, Plainfield is a suburb of Cranford. — HORATIO L. BOND, Secretary, 31 Concord Avenue, Cambridge, Mass. JAMES A. PENNYPACKER, Assistant Secretary, Room 661, 11 Broadway, New York, N. Y.

## 1926

The Secretary would be perturbed over the absence of Class news if he did not feel that it derived from the intense training which members of the Class are undergoing for the Reunion in June. The Secretary, knowing something of the plans that are being formulated by the Reunion Committee, discreetly hints that such a training is necessary if the Reunion is to be thoroughly enjoyed. Remember the date, June 6 and 7.

In order that the committee may have sufficient funds with which to work, the Class is being asked to pay Class dues for the first time. It is a small amount — \$2.00 — and all who thus contribute to the Class exchequer will receive the notices and information which are to be distributed. Please make your remittance to the Secretary at the address below.

News has just reached the Secretary of the death of Hiram M. Datesman on November 2, 1930. — A number of '26 men have gravitated back to the Institute to become members of the staff. Among them is John B. Wilbur, who is now an Instructor in Civil Engineering. Wilbur was married October 30, 1926, and now has one boy, age three.

On December 26, 1930, the engagement of Donald S. Cunningham to Miss Dorothy I. Pratt of Brockton was announced. — Another engagement of interest is that of Morton Woodason to Miss Polly Feener of Salem on December 27, 1930. — William H. Hamilton was married to Miss Mary Cloud Bosworth of Lexington, Ky., on December 20, 1930. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M. I. T., Cambridge, Mass.

## 1928

We extend the glad hand of congratulation to our good friend Jim Donovan. On December 20, Mrs. Raphael Cooper-Marshall of Cambridge announced the engagement of her daughter, Miss Frances Louise to our lucky classmate. Jim's engagement was announced at a tea given by Miss Suzanne Ricker of Cambridge, a former classmate of Miss Cooper-Marshall at Radcliffe. Miss Cooper-Marshall graduated from Radcliffe in 1928 after receiving her early education in England. Since graduation she has held the position of assistant director of the appointment bureau at Radcliffe. Jim is working on a chemical research problem.

There are a great number of our '28 friends whose movements remind one of a knight in a chess game. Every time we hear from them, they are in a new location. Walt Dean seems to fit this description perfectly. After graduation he entered the government service at the Naval Aircraft Factory in Philadelphia. Leaving there in 1929 he went with the Comet Engine Corporation in Madison, Wis., to assist in the development of aeronautical engines. Now we hear that Walt is back in the Quaker City where he is associated with the American Engineering Company and is particularly concerned with the development of their Hele-Shaw hydraulic variable speed gear.

Chuck Topping of Course I is working in New York City with the Public Works Engineering Corporation, the engineering department of Tri-Utilities Corporation. He is living at the Phi Gamma Delta Club in New York. — Joe Parks is still trying to show New York druggists why the E. L. Patch Company's products are the world's finest. From all indications Joe is learning the business from all angles. He first worked up through the production departments at the Patch Company in Stoneham and since then has been engaged in sales promotional work. He is living in New Rochelle, N. Y., at 43 Lockwood Avenue. Course II men are urged to drop Joe a line giving their addresses and all important facts about their work, women, wives, worries, or what have you. Joe tells of meeting Bob Mercer on the Boston to New York bus Columbus Day. Bob is also a member of '28's New York delegation. He is now living at 5 West 63d Street.

Dave Donovan recently returned from a nine months' visit in Germany. He is now with the Sanford Eldredge Corporation at 120 Wall Street, New York City. We understand that he looks the part of the successful banker in spite of the stock market. — Cy Meagher is running grades and lines for the new subway on the Grand Concourse in the Bronx. Cy has been doing a large amount of field engineering work in the "wide open spaces." He is now living in Mount Vernon. — Johnny Jay Junior Collins sent in a letter but the information about his job was a bit incomplete. At the time of writing John was in Detroit establishing a branch of some marketing organization. He says the branch idea was directly inoculated by some of the ideas stimulated in Course XV.

Al Knight has recently changed his interests from bonds to soap. He is now working in the sales statistical department of Lever Brothers Company, Cambridge. — A recent letter from Bill Snyder reveals that he is still associated with the Globe Superior Corporation of Abingdon, Ill., — the same firm he started with after graduation. — GEORGE I. CHATFIELD, *General Secretary*, 420 Memorial Drive, Cambridge, Mass.

## COURSE I

A recent meeting of the New York Section of the A. S. C. E. came very near to being a I-'28 reunion. Jameson, Weinberg, Cristofalo, Ure, Cook, Cohen, and I were there and others may have been lost in a rather large attendance. As I've noted before, Jake was married last October and he is now very happily located at 301 East 21st Street, New York City. He is working for Starratt Brothers and Eken on a new freight warehouse for the Lehigh Valley Railroad, one of the biggest jobs in New York at the present time. At the meeting Weinberg told me that he had started work just that week as assistant superintendent for Bing and Bing on the construction of a new apartment house. Charlie Cristofalo is still with a survey organization in Mt. Kisco. They had just

received a survey job for taxation purposes that would last six months and so help tide them over bad times. — When Barney Ahlers practically suspended operations a short time ago both Ed Ure and Cy Meagher lost their jobs in the cut. Both are now working on subway construction, but, I believe, for different contractors. Cook is still on subway work but now with the Corson Construction Company on the Houston Street section of the work. This section is in sand formation and is interesting in that Dr. Terzaghi and Dr. Gilboy conducted extensive field and laboratory tests for the Corson Company, the results of which greatly affected the design of the subway.

A Christmas card from Jones indicates that he is now at 1200 Massachusetts Avenue, Cambridge. When last heard from (that is, in detail) he was in Chicago. We should like to know what has happened since that time. Cards also told us that Joyce, Luby, and Clark were still located as usual in St. Louis, St. Paul, and Chicago, respectively. — Hal and I enjoyed an evening with Shipley recently. We had dinner with him and his family at their home 453 West 152nd Street, New York. Ship is still attached to the Air Corps at Mitchell Field. He is assigned to detached service quite regularly, however, and his most recent job of this type was taking charge of the air corps unit of the R. O. T. C. at New York University for a short time during the absence of the regular lieutenant. Prior to that he spent three months at Aberdeen Proving Grounds towing targets for anti-aircraft fire of Army gunners.

George Mangurian, still in Hartford, manages to visit Boston regularly and New York somewhat less regularly. A recent letter includes these items: "... I made an appointment with the Hon. William J. Kirk to have lunch with him Friday noon. At the appointed time he appeared and we withdrew to the Chamber of Commerce building to ponder over the present business conditions. Kirk has lost quite a bit of weight, from overwork he says, but I told him it was probably from pressing social engagements as it seems all his evenings are occupied. Bill tells me that Tally is still working with the New Hampshire State Highway. Guertin is working for some granite block company up in northern Massachusetts. ... I bumped into Ed Holmes in Harvard Square. He said he was home from Troy, N. Y., for a week and is to report Monday in Washington, D. C."

A letter from Al Daytz gives his history for the past year. His new address is 135 Columbia Road, Dorchester, Mass. Daytz was with the Boston and Maine when he last wrote. This time he says: "I left the Boston and Maine on April 15, to work for Stone and Webster. Three or four months with them was an eye-opener and as a result I went to Mark Linienthal around August 1. He was engineer on the 20-story Professional Arts and Medical Building that is being erected next to the Copley-Plaza. I picked up plenty of experience with that organization but eventually the depression hit them.



1928 Continued

Before that happened I became connected with the Boston Transit Department and at first worked days for them and nights for Linienthal, but after a short time dropped the latter entirely. My experience with the Transit Department has been varied and very interesting. Previous to the time that I made my connection with them I had had nothing but steel experience but now I am doing nothing but reinforced concrete. I am working on the Kenmore Square and East Boston Tunnel jobs." Daytz adds that his wife and baby are both in the best of health.

—GEORGE P. PALO, *Secretary*, 1095 Jerome Avenue, New York, N. Y.

# COURSE X

We had a most interesting letter from Jack Rouleau way back in September and for all we know the news he gave us is still perfectly good. Jack is back at the Institute working for a doctor's degree, and is there as Professor Ryan's assistant. Jack also notes that Owen Rideout is back on leave of absence from Hercules studying for a Master's. Rumor has it that Johnny Mayoral was to be back at the Institute working for a doctor's degree last fall. We must also not omit noting the fact that Jack was at the Bangor Station as assistant director of the practice school last summer.

In reply to Jack's inquiry about the marital status of your Secretary, we wish to state that we have been married for nearly two years and thought the whole world knew it. Jack asked the following question: "How about dividing the group off in small groups alphabetically and holding them responsible for some news in each issue?" We shall do that forthwith, although we fear we may be just holding them responsible. Of course, any infringement of the alphabetical arrangement will not be penalized, but very gratefully received.

We must at this time also note a Christmas card from good old Herb Dayton from way down in Baytown, Texas. He signs it, "Mr. and Mrs. H. P. Dayton and family." We are not just clear on the family part of it, but maybe Herb will elucidate. However, if it is what one might guess, it appears that Herb has the Class Baby, unless somebody else has been holding out.

Very recently we have received the announcement of the marriage of Ken Hawthorne to Miss Dorothy Jackson at Cedar Rapids, Iowa. To Ken we extend the felicitations which accompany so notable an event. May Ken and Mrs. Hawthorne have a long life and a happy one. — Although you probably know it, and we are somewhat late in reporting it, Bud Reynolds joined the ranks of the benedicts last July in Boston. Marriage has made Bud a whole lot more domesticated.

We hear that Ray Beveridge has gone with some "dry ice" company, the location of which we do not know. — Red Stachelhaus is at the present time with a metal refining company in Attleboro, Mass., and from all accounts is progressing finely. — As to the chemical engineers in Akron, of whom only Bud

Reynolds and I remain, nothing much is to be reported. Bud has forsaken chemical engineering for production work and is now a night superintendent. Yours truly has given up trying to wrest the secrets of science from her reluctant bosom (i.e. research) and has gone into chemical engineering development.

Below are listed the names of our Class members, as well as I could reconstruct them from various sources. We have three issues left in this volume after March, so I shall expect letters from the first eight men right away. Andy Anderson, Maury Beren, Ray Beveridge, Brownie Brown, Bob Carder, Ed Celette, Gus Colarusso, Mike Comperchio, Gordon Collins, Herb Dayton, Jim Donovan, Carl Ferre, Don Fraser, Habe Haberstroh, Dave Haines, Yu Kun Ho, Dick Hoak, Bill Hurst, Joe Jamison, Ray Jack, Nap LaCroix, Jim Latimer, Carl Lockhart, Ben Miller, Willis Moore, Bob Proctor, Al Puschin, Bud Reynolds, Owen Rideout, Jack Rouleau, Sark Sarkisian, René Simard, Smitty Smith, Charlie Southwick, Gus Stachelhaus, Don Sturznickle, Phil Taylor, Ed Taylor, Gilly Toone, Chang Tu, Ed Welcyng, Fred Zappini. — ALBERT J. GRACIA, *Secretary*, 2035 18th Street, Cuyahoga Falls, Ohio.

# 1929

A couple of week-ends ago Jerry Palmer, V, journeyed down to Akron from Cleveland to view the Zeppelin Dock and the construction of the world's greatest zeppelin at the Goodyear Zeppelin Corporation. He brought two friends along with whom he works, one from Michigan and the other from Minnesota. They came out to see me and I joined them on their trip out to the Hangar or Dock. Their work with the U. S. Aluminum Company made them especially interested in the work on the new ship, for their company, a subsidiary of the Aluminum Company of America, is furnishing the duralumin for the framework of the zeppelin. We spent the afternoon looking over the work and Jerry headed back to Cleveland. His visit of a few hours gave us quite an opportunity to talk over old days at the Institute. His work is now on ornamented finishes for metals and he enjoys it. He is now living at 1928 E. 90th Street, Cleveland and wants to be remembered to all of the Class.

A couple of months ago Howard Pankratz, XVII, too, came to town to look over the Zeppelin Dock, but his stay was so short that we could not get together. — Last week Cap Clary, II, and I just about bumped into each other down town in Akron. Here it has been more than a year and a half since we both emigrated out to these parts and that has been our first meeting. Cap is with Firestone in their engineering department and is getting full advantage of some of his senior courses, for he is designing power plants. He is enjoying his work, but like others in the rubber industry, he is not making much money just yet.

Now we come to the news of those among our classmates who care not for single blessedness, but who whisper "let

us join the ladies." In Springfield, Mass., the engagement of Ed Farmer, VI, and Miss Clara Elizabeth Martin is announced. — In the Woburn (Mass.) *Times* it is announced that Eric Bianchi, II, and Miss Katherine Denison are engaged. The Class joins in congratulating both of these classmates and wishes them much happiness.

Rudy Swan, VI, and Adam Stricker, IX-B, were both heard from by means of Christmas cards. Ed Farmer, too, crashed through with a greeting, but no news other than the card from any of them. Those cards, however, were more than we have had from most of the boys in our Class, so let's go for a record news year. — EARL W. GLEN, *General Secretary*, 339 Hillwood Drive, Akron, Ohio.

# Technology Association of Northern California

The Tech dinner and smoker held January 7 at the California Inn was a howling success. It demonstrated that the Technology Association of Northern California like our beloved San Francisco may now claim to "know how." The dinner was attended by 41 alumni representing classes from '96 to '28, inclusive, and walks of life from educational, industrial and utility tycoons to high privates in the rear rank of the Army of the Unemployed. At least 15 of those present commented to your Secretary that they "had never imagined a bunch of Tech men could have such a good time!" No set program was arranged. Doc Maier '14, acted as toastmaster and got the ball rolling with a few well-chosen remarks and then called on different members (who had been warned beforehand, by the way) for stories. After the first few stories had been told rules of order had to be applied to keep more than one person from telling a story at one and the same time.

Stan Hall '14, has gotten the weekly lunches started on the East Side of the Bay. These lunches are held on Mondays at the Athens Club on Clay Street, between 12th and 13th, Oakland. The first meeting was held January 19 and was regarded as very successful. Any Tech men in Oakland or Berkeley or other East Bay locations will find a pleasant welcome at these lunches. Of course the San Francisco lunches on Tuesdays at the Engineers Club, 206 Sansome Street, are running as usual and getting better all the time. — JOHN K. HELLER, '16, *Secretary*, 562 Sutter Street, San Francisco, Calif. Phone Garfield 5818.

# Detroit Technology Association

The Detroit Alumni have arranged with a local commercial service to furnish addresses and other information concerning the members of our local association to Alumni from other sections of the country. This is done by listing Massachusetts Institute of Technology Alumni in the Detroit Telephone Directory, and showing the phone number of the service company, who upon call will give any



information on their records. — JOHN E. LONGYEAR, '26, *Secretary*, 2000 Second Avenue, Detroit, Mich.

### *Technology Association of Japan*

Tamio Kasahara, '24, sent in the following: "On November 27, the Technology Association of Japan held one of its annual meetings at the Japan Industrial Club. There were about 40 members present. Of course Dr. Dan was there. The main purpose of the meeting was to discuss methods by which we could derive the greatest amount of benefits from the use of the new club room which has been generously provided for us, completely furnished and free of charges for the period of two years, by one of Mitsui's sons who is a member of this club. We decided that we should use this new club room to promote fellowship among members by holding many informal meetings there, instead of only two meetings in a year as had been the practice.

"Another thing — the new club room should be used to welcome and entertain foreign graduates whenever they visit the city. At this juncture of discussion, Dr. Dan reminded us that we shall be able to test the usefulness of the new club room pretty soon, because we shall have a visitor from America — Robert S. Breyer '10, of Los Angeles. So you see Mr. Breyer's visit is a fact among members of this club. He will be invited to tell us all about what's going on in the old U. S. A. whether he wants to or not. I think he had better take my advice and fill up with facts about automobile business or what not before he says farewell to sunny Los Angeles." — MASARU KAMETANI, '25, *Secretary*, Mitsui Gomeri Kaisha, Mitsui Main Building, Tokio, Japan.

### *Rocky Mountain Technology Club*

The first meeting of the year of the Rocky Mountain Technology Club was held at the University Club of Denver at

noon, January 14, with the following members present; President Severance Burrage '92, Secretary Arthur L. Hill '23, Dean E. Batchelder '28, Willard E. Edwards '26, Benjamin V. Howe '26, Major Cleon J. Gentzkow '28, Benjamin F. Powell '23, Harold O. Bosworth '02, Sidney S. Emery '93, Rudolph H. Fox '12, Murray G. Graff '16, Frank M. Ladd '88, Maxwell Parshall '28, Frederick L. Peart '19, and Clifford R. Wilfley '06.

A letter from Benjamin E. McKechnie '02, was read during the first course. McKechnie is in Soviet Russia, and his letter described some of the interesting conditions there. Several photographs accompanying the letter were passed around meanwhile. After luncheon President Burrage read a letter from the Secretary of the Alumni Council advising that an impostor was at large, preying upon Technology men. A letter from the Lincoln Electric Company was also read offering films for a future meeting, and in the discussion that followed, it was decided that two of these would be of interest, Major Gentzkow offering to provide a projector. A third letter gave a report from Dean Loddell on the men at the Institute who had been selected to receive scholarships by this club.

A discussion of future meetings followed, there being some feeling that there should be a settled policy in regard to this. Dr. Burrage explained that it was necessary to have some flexibility in arranging programs, and a dinner to be attended by members' wives was then proposed. Bridge was suggested at such a meeting but with some objections, and although no definite date was set, such a meeting was considered desirable. Dr. Burrage announced he would be glad to have the next meeting at his home, and the Secretary was instructed to write for the films to be shown. This was decided to be held on the evening of February 12. — WILLARD E. EDWARDS, '26, *Secretary*, 417 Downing Street, Denver, Colo.

### *New Haven County Technology Club*

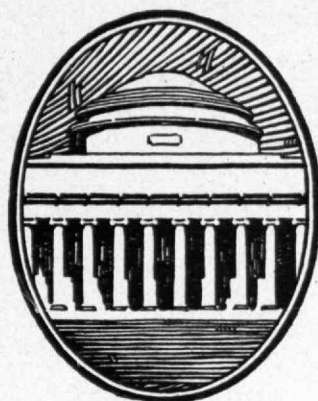
The New Haven Technology Club held its meeting January 10, at the Prattonia Coffee House on Howe Street, New Haven. A splendid dinner was served which was loudly appreciated by all. After the meeting the members adjourned to the Yale Gymnasium on Elm Street, where they witnessed the M. I. T. vs. Yale wrestling match. There was a good attendance of the members bringing their families to enjoy the sports. — CHARLES P. McHUGH, '26, *Secretary*, 243 Lexington Avenue, Fair Haven, Conn.

### *Technology Club of Rhode Island*

It will be interesting to others of the Institute Alumni to know that in Providence we have a very active Technology Club that holds interesting meetings frequently. The attendance is large and enthusiastic and the entertainment varies considerably from high-powered discussions of engineering topics to bowling, contract bridge, and undergraduate wrestling matches.

On the evening of October 28, forty-four of the Rhode Island men enjoyed the opening meeting of this year at the Wannamoisett Country Club. Some of the men played golf and others enjoyed a variety of indoor sports for which Rhode Island is justly famous. In all seriousness this was a very good meeting. The second meeting of the year was held in the To Kalan Club of Pawtucket, where an exciting bowling match was staged for the special edification of the very few who could not get on the alleys at once.

It is with deep regret that I have to announce the death on October 6, 1930, of one of our most interested and interesting members who always attended our meetings and who was held in the very highest esteem by all of us — Ralph E. Thurston '02, of the Putnam Light and Power Company, lately of Putnam, Conn. — J. BURLEIGH CHENEY, '11, *Secretary*, 1776 Cranston Street, Cranston, R. I.



# INFORMATION

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**T**HE TECHNOLOGY REVIEW BUREAU exists to supply authoritative information to anyone interested in details regarding the Massachusetts Institute of Technology. It serves as a clearing house for inquiry and aims to further the spread of exact information regarding entrance requirements, outline of courses, subjects of instruction and other information which may be of aid to the students considering undergraduate or graduate study at the Institute.

The Institute publishes a variety of bulletins, fully descriptive of individual courses, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

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**AB:** For general information, admission requirements, subjects of instruction, ask for Bulletin AB.

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Here the patient is working out on a treadmill. The cardi tachometer in the foreground furnishes a record of his pulse rate, the glassware supplies information about his oxygen consumption, the treadmill measures the energy he expends. These are all-important data in fatigue studies.



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